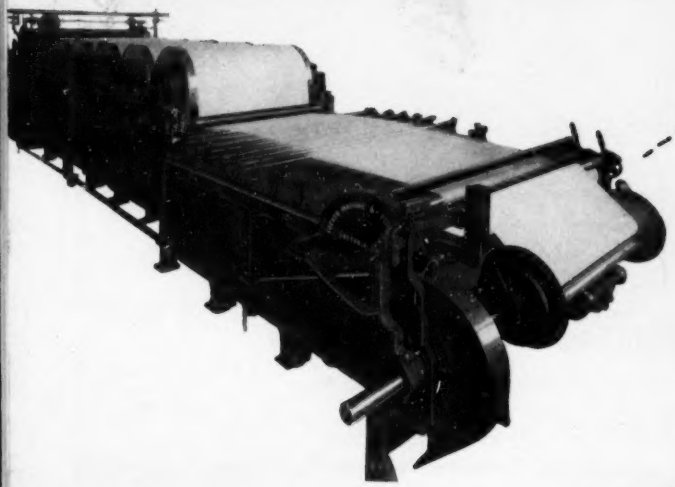
MARCH, 1951

Textile Industries

COTTON
Textile Industries



The Cocker 9-Cylinder Slasher for Cotton—Spu[illegible]aments

ocker equipment includes warpers for all purposes, creels for all types of yarn, ashers and beamers of all types, and all auxiliary warp preparatory equipment.

uring the 70 years in which Cocker has been making this equipment its engineers ave pioneered almost all of the improvements which are now universally acclaimed. e new Cocker Slasher Friction for making hard beams, and the electronic relay op motion, patented by Deering Milliken Research Trust and manufactured by ocker are just two of the outstanding improvements recently included exclusively Cocker equipment.

all on Cocker for equipment and for expert engineering counsel.

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AROUND THE WORLD

Machine and Foundry Co., Gastonia, N. C.

WORLD'S LARGEST DESIGNERS AND BUILDERS OF COMPLETE WARP PREPARATORY EQUIPMENT

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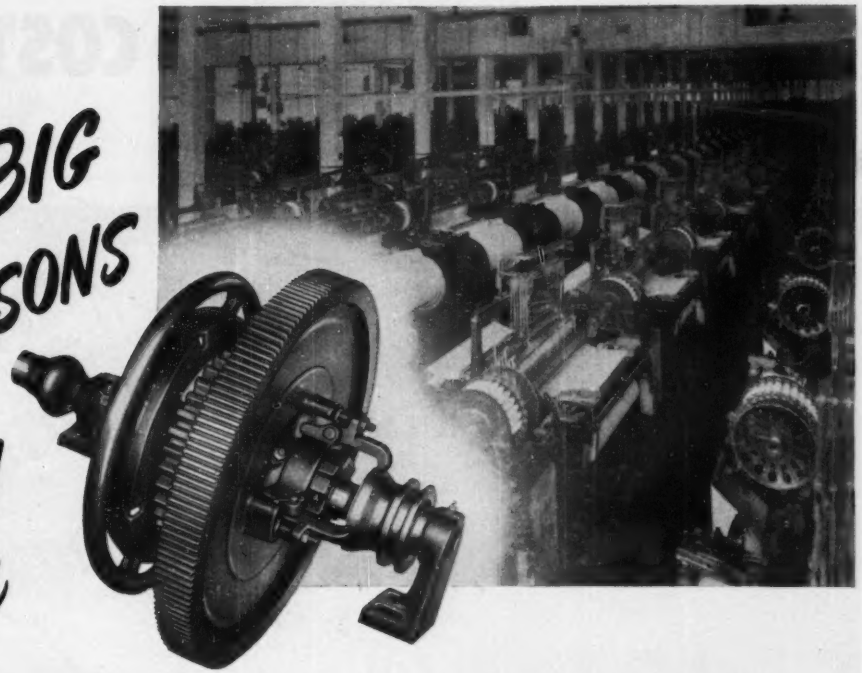
Volume 115 Number 3

4 BIG REASONS why the



#10 DRAPER Drive is Best for Your X & XK Model Looms

1 Power is applied direct from the Clutch Friction Gear to the Crank Shaft Gear rather than through a series of parts keyed to the Crank Shaft. This greatly reduces the tendency of parts to loosen.

2 The Driving Clutch Collar and Fingers rotate with the Clutch Friction Gear and therefore are not subject to torque strain. Construction further permits easy replacement of worn parts while the Crank Shaft is still in the loom.

3 The Clutch Friction Gear is equipped with hardened steel Clutch Finger Plates which eliminate wear caused by Clutch Finger action.

4 After the original setting, Clutch Finger adjustment is no longer necessary. All further adjustments can be made with the Driving Clutch Collar.

DRAPER CORPORATION

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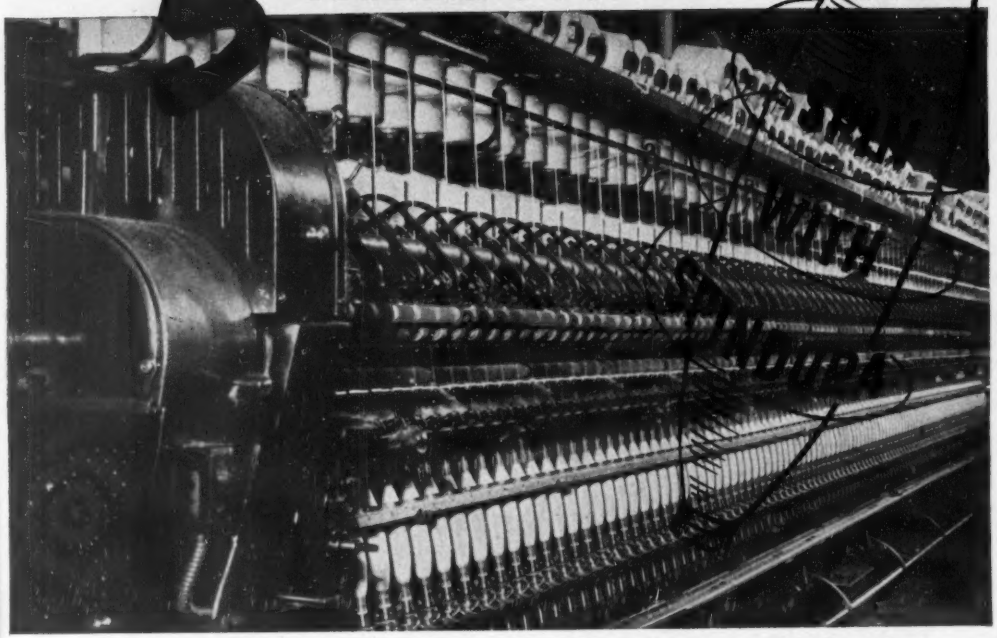
TO REDUCE SPINNING COSTS 5 WAYS...



You can lubricate all types of spindles with *Texaco Spindura Oils* and count on reduced costs through—

1. *Increased Production*—because the sturdy films of free-flowing *Texaco Spindura Oils* protect spindles better, permit full-speed operation with heavy packages, reduce ends down.

2. *Better Quality* — because *Texaco Spindura Oils* assure smoother, more uniformly twisted yarn. They won't thicken or gum up like ordinary oils; but constantly cushion spindles against vibration, eliminate hunting and lagging . . . thus reduce chafing and unevenness.

3. *Less Power Consumption* — because *Texaco Spindura Oils* minimize frictional "drag" in both starting and running.

4. *Reduced Spoilage* — because *Texaco Spindura Oils* won't atomize and fog-damage yarn on adjacent spindles.

5. *Lower Lubrication Costs* — because the longer lasting effectiveness of *Texaco Spindura Oils* means fewer applications necessary.

Texaco Spindura Oils meet all spindle manufacturers' requirements for effective lubrication of spinning, throwing, spooling and twisting spindles . . . and there is a complete viscosity range to meet all your needs.

Let a Texaco Lubrication Engineer help you reduce spinning and other costs throughout your mill. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

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FOR THE TEXTILE INDUSTRY

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Textile Industries

COTTON

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Maynard L. Durham
Business Manager
Business Representatives

Boston—ARTHUR C. SHAW, 11 Monroe Rd., Wellesley Hills, Mass. (Phone: Wellesley 5-3648).
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Philadelphia—RODMAN HANSON, 708 Hendren St., Philadelphia 28, Pa. (Ivy Ridge 3-4176).

John C. Fonville
Editor

ASSOCIATES

J. Frank Guest — Hunter Hughes, P. O. Box 968, Rock Hill, S. C.
Milton C. May — Paul M. Platzman, 22 Ridge Drive East, Flower Hill, Roslyn, N. Y.
H. B. Anderson

CONSULTING EDITORS

F. Gordon Cobb
Ben H. Crawford
J. A. Moody

Production Manager

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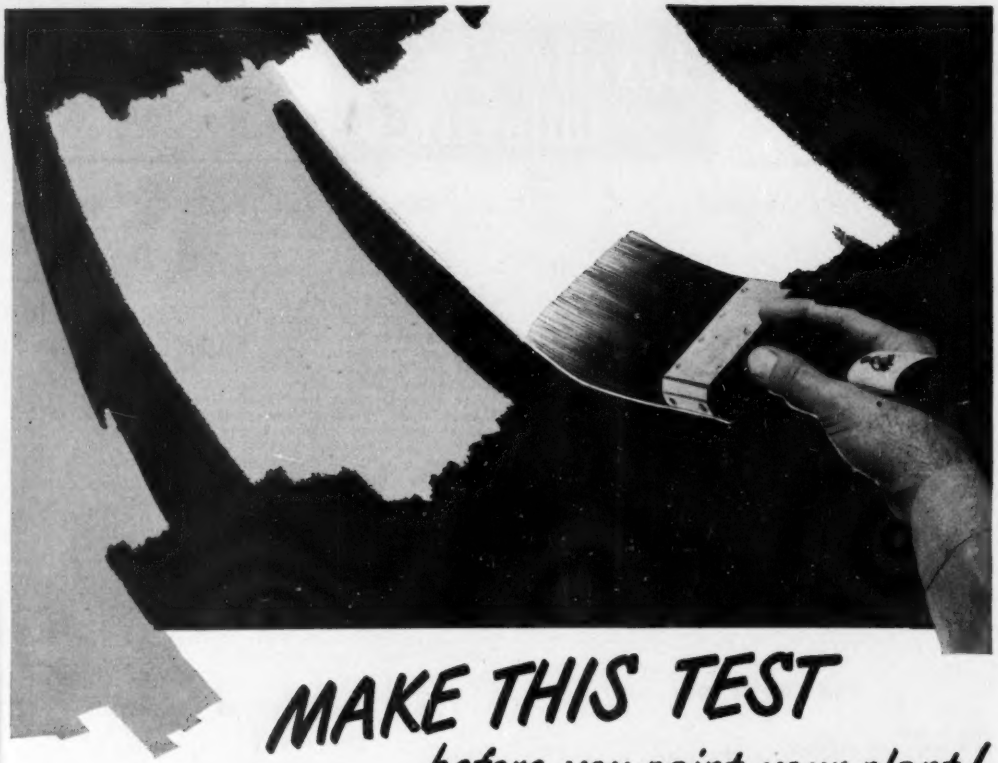
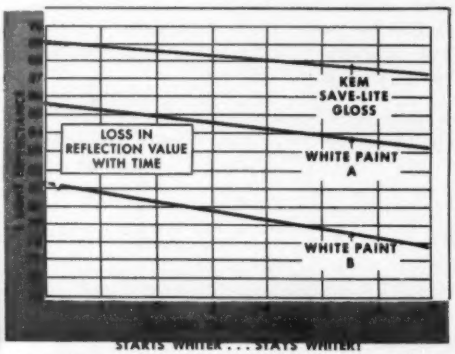


MAKE THIS TEST

before you paint your plant!



STARTS WHITER . . . STAYS WHITER!

Note how the whiteness, or reflective value, of Save-Lite *starts* higher than conventional finishes when first applied, and *continues* higher, as time goes on. This means *longer* intervals before repainting is required.

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SEE why it stays cleaner—longer!

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You can see the difference, from the start, in gleaming, brilliant whiteness . . . a difference because of the *controlled,* light-reflective properties that are designed into SAVE-LITE Mill White Finishes.

KEM SAVE-LITE *starts* whiter . . . KEM SAVE-LITE *stays* whiter, as the actual light reflectometer measurements in the comparative chart show. You'll find these same properties, too, enable it to hide better and cover farther! Call your Sherwin-Williams representative today for a demonstration, or write The Sherwin-Williams Co., Cleveland 1, O. (Division Offices, Charlotte, N. C. and Boston, Mass.)

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RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER

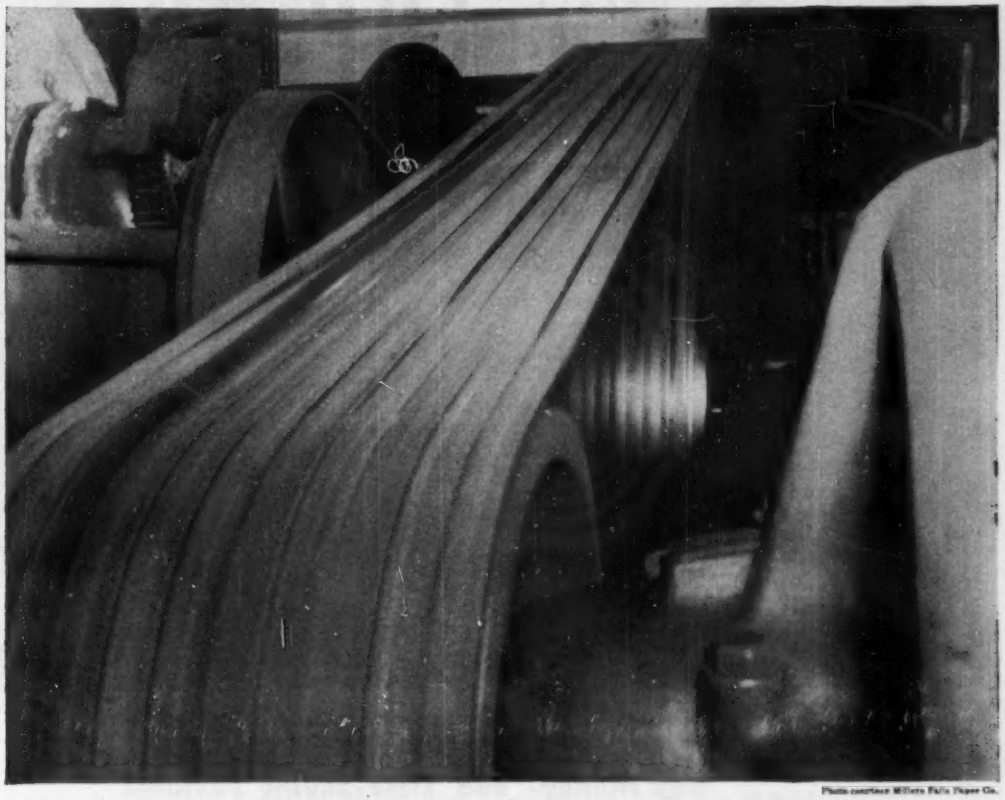

Photo courtesy Millers Falls Paper Co.

Where B. F. Goodrich grommet belts lasted 8½ years

B. F. Goodrich grommet V belts cut costs 20 to 50%

GROMMET V belts (made only by B. F. Goodrich) handled a transmission job on this drive 24 hours a day for 8½ years. The service is rough —starting causes shock loads, pulsations. The drive is fully equipped with B. F. Goodrich grommet V belts—here's where that extra strength and longer life come from:

No cord ends—A grommet is endless, made by winding heavy cord on itself to form an endless loop. It has no overlapping ends. Because most of the failures in ordinary V belts occur in the region where cords overlap, the endless cord section in a grommet V belt eliminates such failures.

Concentrated cord strength—All of the cord material in a B. F. Goodrich grommet multiple-V belt is *concentrated* in twin grommets, positioned close to the driving faces of the pulley. No layers of cords to rub against one another and generate heat; cord and adhesion failures are reduced.

Better grip, less slip—Because a grommet is endless, a grommet V belt is more flexible, grips the pulleys better. Size for size, grommet multiple-V belts will give ⅓ more gripping power, pull heavier loads with a higher safety factor.

Only B. F. Goodrich has the grommet!—No other multiple-V belt is a grommet V belt (U. S. Patent No. 2,233,294).

Now available in C, D and E sections. See your local B. F. Goodrich distributor. Ask him to show you his "X-ray" belt that illustrates grommet construction clearly. *The B. F. Goodrich Company, Industrial and General Products Division, Akron, Ohio.*

Grommet V Belts BY
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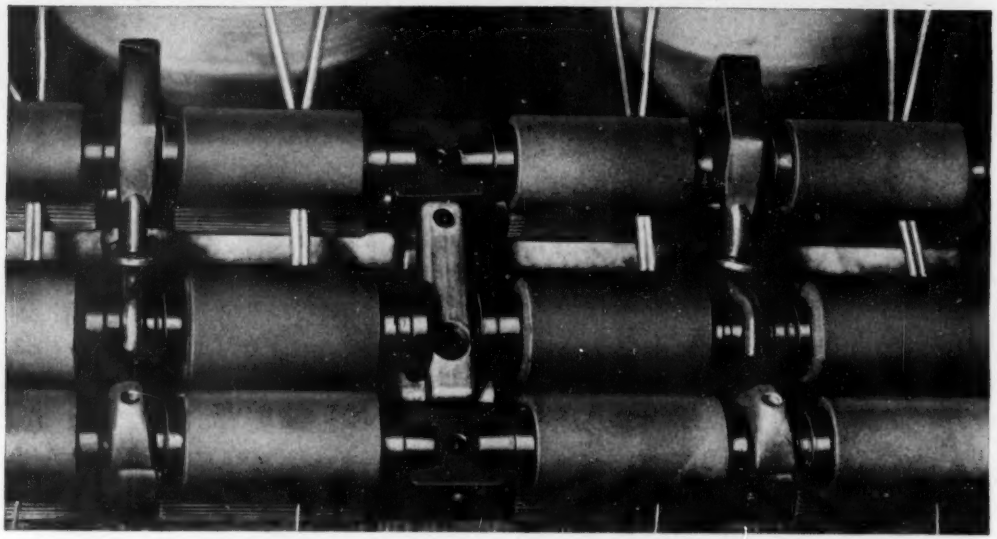
RUBBER FOR INDUSTRY

SACO-LOWELL-TORRINGTON

S-L-T NEEDLE BEARING TOP ROLL

FOR ROVING AND SPINNING



Requires only annual lubrication... Shells interchangeable from arbor to arbor... Shell covering interchangeable at will... No yarn spoilage from black oil... these are a few of the

18 Money- and Time-Saving Features of this new S-L-T Needle Bearing TOP ROLL, described in detail in a series of mailing pieces prepared for Management, Supervisors and Textile Engineers who are desirous of keeping up with the latest developments in the industry. If you are not receiving this series, a request to our nearest sales office will bring them to you.

Every mill should try out at least one frame of these S-L-T Top Rolls. We have a special plan which makes this possible on a very economical basis.

S-L-T TOP ROLLS are manufactured by THE TORRINGTON COMPANY, Torrington, Conn., and are available exclusively through

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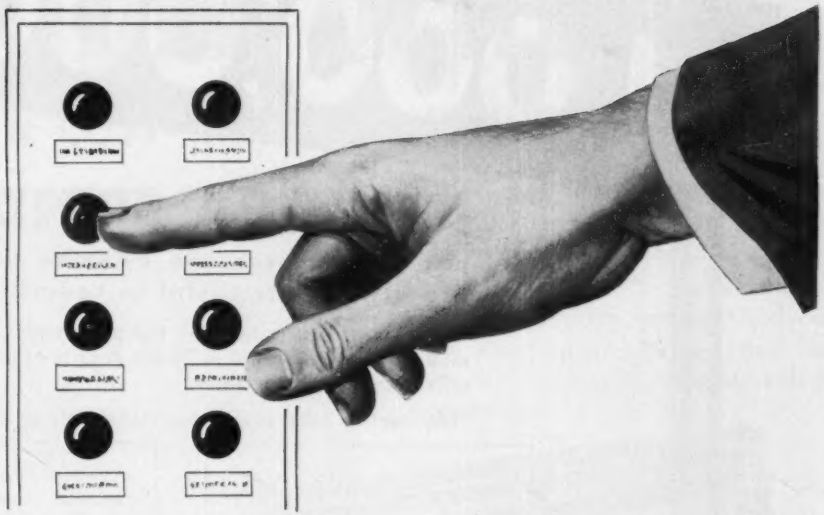

How Do You Measure Service?

Mill men who need a critical repair part can measure **service** in actual dollars lost while a machine stands idle — **prompt delivery** of the right part means dollars saved.

To E. E. Smith & Son, service is a priceless reputation, built by meeting the exact requirements of southern mills for 20 years . . . measurable only by the sure knowledge of mill men that when quality machine parts are needed, E. E. Smith & Son is the **swiftest, surest source.**

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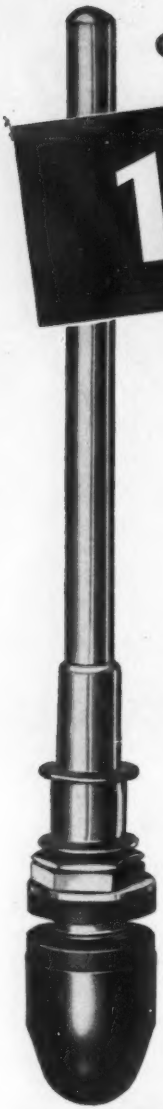

OPERATING OVER

1,000,000

NEW ERA SPINDLES

has given us concrete evidence that they are always successful in reducing costs.

Reports are coming back on the performance of over a million New Era Spindles. Those reports have considerable authority behind them!

They contain such convincing statements as these:

"No greasing or oiling has been done to these spindles since their installation over two years ago"

"Yarn quality produced from spinning frames equipped with New Era Spindles is definitely improved. We attribute this to the more uniform speed"

"Wear on spinning tapes is cut to a minimum, and we are replacing 60% less tapes on New Era Spindles than on the conventional type"

"More labor saving, material saving and replacement saving"

"The investment in these spindles and bobbins will pay its way out in about four years. These spindles have to date been no maintenance problem whatever"

"It was found that our spinning frames could be operated with a 7½ HP motor instead of the 10 HP motor required with the old type spindle"

A trial installation of New Era Spindles in your mill will quickly demonstrate how you can save power, reduce maintenance, and improve quality. On request, our engineers will make a forecast of savings that are possible with New Era Spindles.

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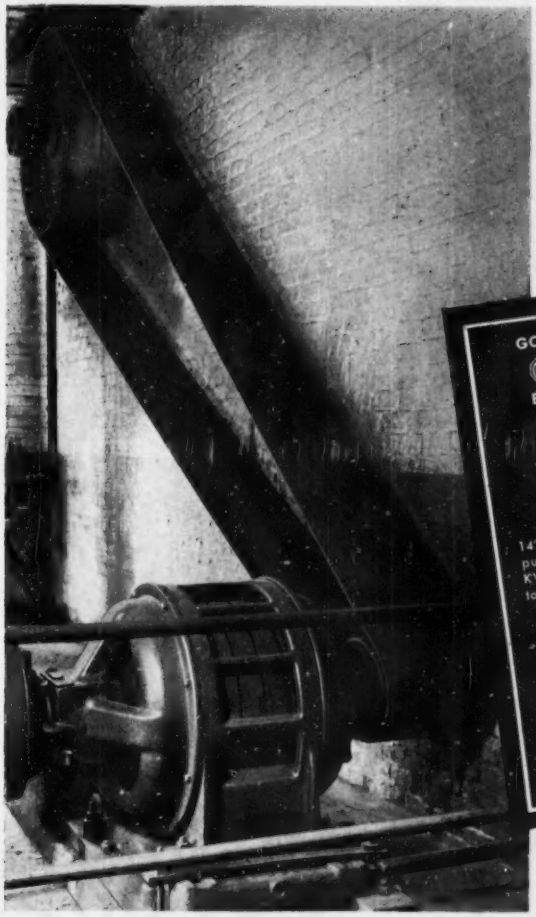
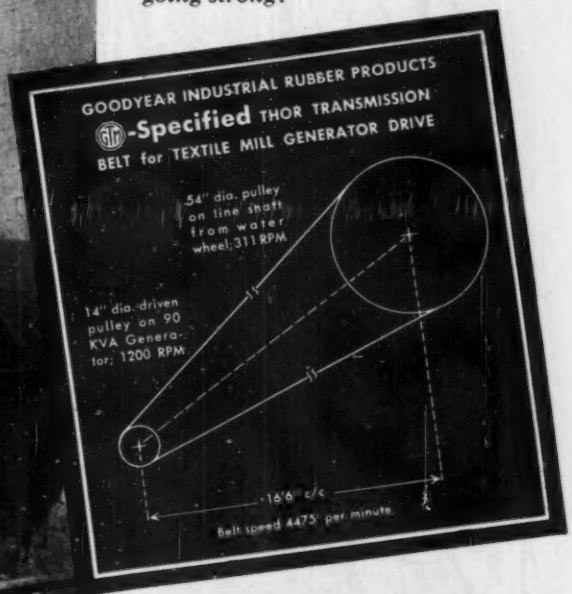
⅔ THE COST—MINIMUM MAINTENANCE—



DUST, lint, moisture and overload caused stretch and wear. Ordinary belts failed in short time.

G.T.M.—Goodyear Technical Man—redesigned the drive, specified Goodyear 7-ply Thor square-edge belt that has been *on drive over 8 years and still is going strong!*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-Specified THOR TRANSMISSION
BELT for TEXTILE MILL GENERATOR DRIVE
54" dia. pulley on line shaft from water wheel: 311 RPM
14" dia. driven pulley on 90 KVA Generator; 1200 RPM
16'6" c/c
Belt speed 4475' per minute

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BIG FASHIONS FROM

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BETTER THINGS FOR BETTER LIVING

. . . THROUGH CHEMISTRY

For nylon . . . for rayon . . .

LITTLE FIBERS grow

Take a fiber
. . . any fiber . . .
say a fiber by Du Pont!
Say the fiber
grows a fabric
And the fabric
starts a fashion
And the fashion
inspires a promotion
And the promotion
highlights a trend
And the trend
builds volume
Say . . . WHERE did all this start?
Remember . . .
BIG FASHIONS FROM
LITTLE FIBERS GROW
Big people
trust the fibers—
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viscose rayon
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from the laboratories of DU PONT

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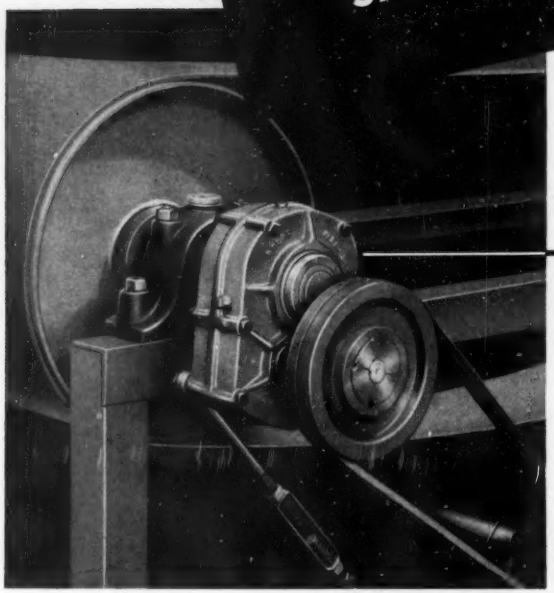
for fibers to come . . . look to DU PONT

THE SPEED REDUCER THAT SAVES YOU MONEY!



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America's Most Complete Line of Shaft-Mounted Speed Reducers

- No special engineering required. No foundation to provide. No flexible couplings. No sliding base. No "lining-up" difficulties. No expensive installation. Stock TAPER-LOCK sheaves prescribed for each job to provide desired speeds. Application to other machines is practical and easy.
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- Compact, light weight, *rugged.* Quality built by Dodge for Dodge *dependable* service.
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- WRITE for special bulletin A602.

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CALL THE TRANSMISSIONEER, your local Dodge Distributor. Factory trained by Dodge, he can give you valuable assistance on new cost-saving methods. Look for his name under "Power Transmission Equipment" in classified phone book.

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V-BELTS AND TAPER-LOCK SHEAVES

DODGE-TIMKEN PILLOW BLOCKS

ROLLING GRIP AND DIAMOND D CLUTCHES

SOLID STEEL CONVEYOR PULLEYS

Avisco "15" Staple Extensively Used in Carpet Industry's Spring Offerings

Widespread approval for Avisco "15", the heavy-denier carpet staple introduced last summer, is indicated by the spring offerings of major carpet manufacturers. Blended with wool or in 100% rayon weaves, it is appearing in floor coverings with unusual surface interest, crisp coloring and excellent wearing qualities. These features and the favorable prices are rapidly winning consumer acceptance.

That rayon has found a permanent place for itself in carpeting is borne out by the fact that more and more leading figures in the industry are predicting an ever-increasing role for synthetics in floor coverings. To back this belief they are making vigorous efforts to promote the new type of product to the consumer.

Avisco has joined in the effort by featuring rayon carpets in consumer advertising, and by providing educational material helpful to consumers and retail salespeople. This concerted effort—plus inherent value—forecasts success for rayon carpets.

MAKE USE OF *Avisco* 4-PLY SERVICE

To encourage continued improvement in rayon fabrics, American Viscose Corporation conducts research and offers technical service in these fields:

1 FIBER RESEARCH
2 FABRIC DESIGN
3 FABRIC PRODUCTION
4 FABRIC FINISHING

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America's largest producer of rayon

Sales Offices: 350 Fifth Avenue, New York 1, N. Y.; Charlotte, N. C.; Cleveland, Ohio; Philadelphia, Pa.; Providence, R. I.

Can't get 'em up on Monday?

If you can't get frame production up after week-end shut downs, due to bands popping off, or waste from slack bands, or from sticky wooden-bearing tape tension pulleys,—do as scores of other mills have done, and

get Meadows Modernizers

and you'll end Monday-morning band, sticky tape-pulley, and cylinder troubles *for keeps!*... Convert your frames to tape drive with Meadows individual drive pulley and ball-bearing tape tension pulleys, and be assured of even tension at *all times*—a more uniform speed and twist—fewer ends down. Can be easily and quickly installed on either band-driven or old-style tape driven frames.

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OILITE may relieve your shortage of critical materials

Particularly in mass-production units of small and medium size, Oilite finished machine parts and bearings can be made to your design in a broad range of ferrous and nonferrous metals and alloys, except as limited by government control. Moreover, Oilite products of ferrous base may serve excellently instead of scarce nonferrous units or as replacements for steel and castings.

When you employ Oilite you also obtain the benefits of more than 20 years' engineering, research, and production experience in powder metallurgy, together with the service of field engineers throughout the United States and Canada.

You are invited to contact the field engineer in your district or write the home office regarding the application to your needs of Oilite products.

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Subsidiary of Chrysler Corporation

DETROIT 31, MICHIGAN

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Heavy duty, oil-cushioned, self-lubricating bearings and finished machine parts in ferrous and nonferrous metals and alloys. Permanent filters. Friction units. Self-lubricating cored and bar stock.

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Oilite is an effective replacement, not a mere substitute

In the last decade, more and more executives have become "Oilite minded" because the advantages are many. To meet the current situation, many of our customers have changed their specifications to replace strategic copper and tin with products of iron powder or iron powder alloys. Others are replacing iron castings, steel and aluminum with similar Oilite products.

Also of importance to executives, under conditions of urgency, are the wide adaptability, the speed of delivery, and the economy of cost, time and manpower which result from the use of Oilite finished machine parts, made from metal powders.

Intricate designs, which normally require many different machining operations, can be produced quickly and economically from Oilite. There is great freedom of design and frequently two or more parts can be combined in a single Oilite unit. Oilite eliminates up to 24 machining operations.

Delivered ready for assembly, Oilite parts save the time and investment required to tool up by standard methods. It is not unusual to be in production on a complex Oilite part within a few weeks, as compared to a possible 18-month delivery of machine tools. Trained manpower is thus released for other urgent needs.

Oilite is not a substitute. It is metallurgy's answer to the need for a new material. It may solve your problem.

President

OILITE
PRODUCTS

We Recommend

the use of

CATYLON

Cation-Active Softener

HART PRODUCTS CO., of Canada, Ltd. · Guelph, Ont. · Sales Office: 2231 Bloor Street, W., Toronto, Ont.

Hartex Products:

Rayon Oils & Sizes	Conditioning Agents	Cationic Softeners
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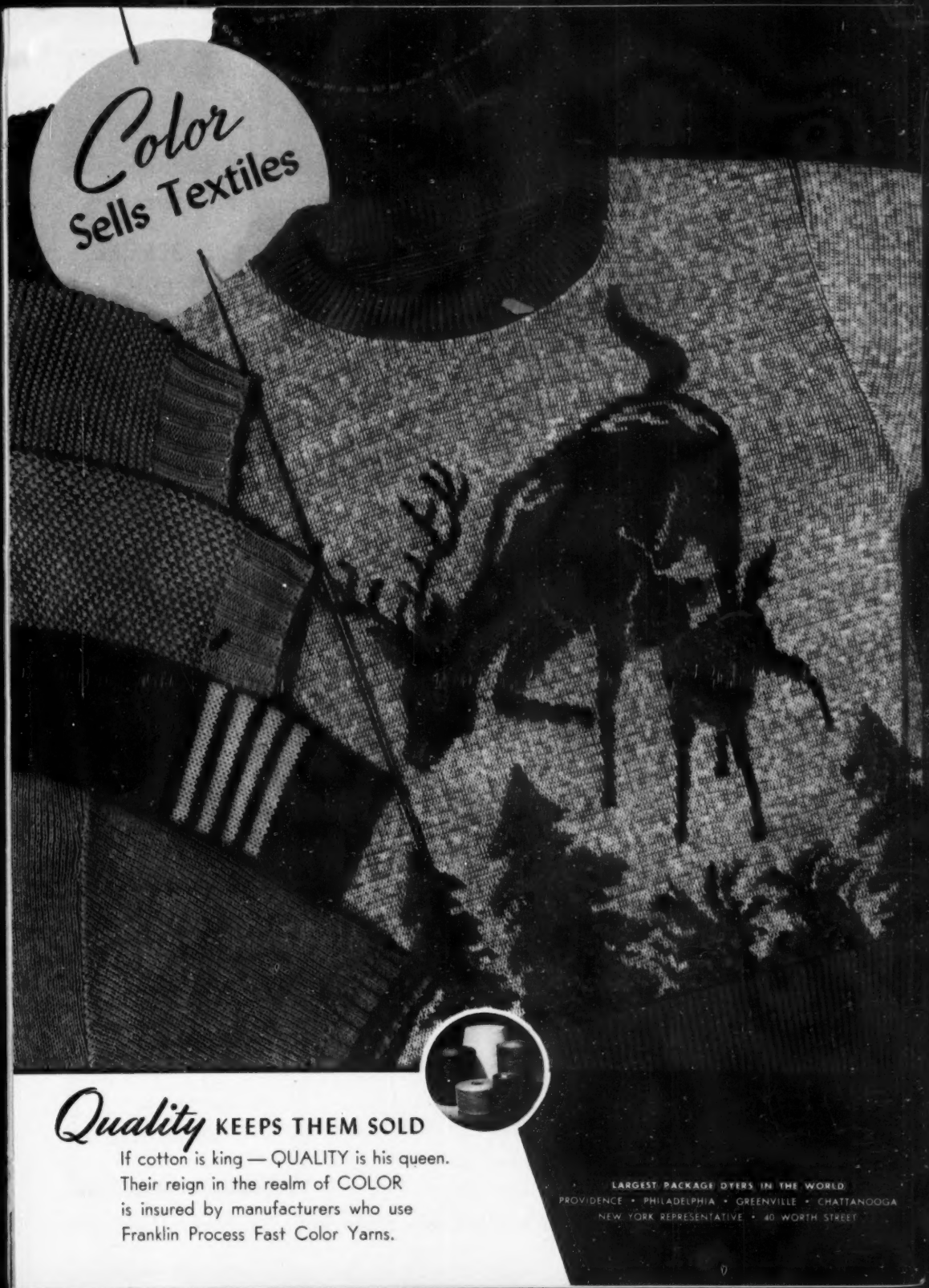
Kier Bleaching Oils	Splashproof Compounds	Wetting-Out Agents
Finishing Oils	Delustrants	Weighting Agents
Synthetic Detergents	Leveling Agents	Mercerizing Penetrants

Hart Products

based on research



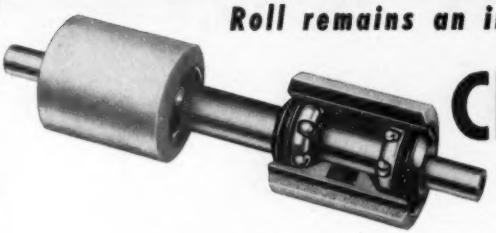
Quality KEEPS THEM SOLD

If cotton is king — QUALITY is his queen.
Their reign in the realm of COLOR
is insured by manufacturers who use
Franklin Process Fast Color Yarns.

LARGEST PACKAGE DYERS IN THE WORLD
PROVIDENCE • PHILADELPHIA • GREENVILLE • CHATTANOOGA
NEW YORK REPRESENTATIVE • 40 WORTH STREET

See how quickly and easily you can re-cover this roll WITHOUT DIS-ASSEMBLING

Roll remains an integral unit at all times

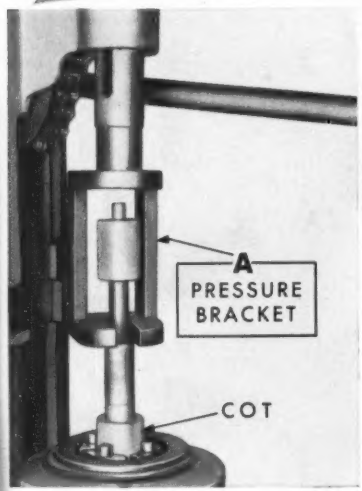


CLIMAX BALL BEARING TOP ROLLS

Patents Pending

Our simple Pressure Bracket (A) fits Armstrong or other cot assembling machines, to apply pressure at center end of shell of Climax Roll.

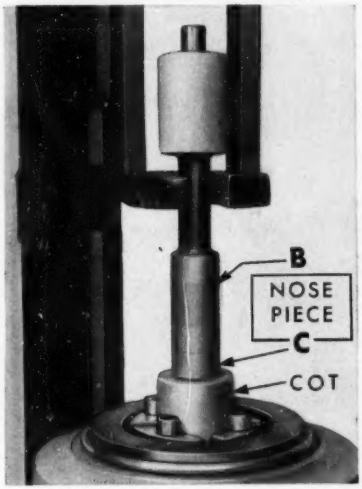
Climax Nose Piece (C), inserted in cot, guides shell (B) into cot as pressure is applied, and prevents glue from entering roll mechanism.



Only CLIMAX

among anti-friction rolls, permits INTEGRAL RECOVERING and INTEGRAL BUFFING—WITHOUT DISASSEMBLING.

(You do not throw away any part of the shell.)



Climax Ball Bearing Top Rolls adopted by

Whitin

MACHINE WORKS

and supplied on Whitin machinery as standard where anti-friction rolls are required. Climax Rolls are available through Whitin Machine Works and all of their agents.

MACHINECRAFT, INC.

21 VERNON STREET, WHITMAN, MASS.

Northern Sales:
Richard K. Butler
P. O. Box 428
Whitman, Mass.

Southern Sales:
Watson & Desmond
P. O. Box 1954
Charlotte, N. C.

Brazil:
Eduard Seelig & Cia, Ltd.
Caixa Postal 5904
Sao Paulo, Brazil

Mexico:
Slabotzky, S. A.
Avenida, Uruguay 55
Mexico, D. F.

Climax Ball Bearing Top Rolls are made for

Cotton System Spinning Rolls for all standard and long-draft systems
Cotton System Roving Rolls
American System Worsted Rolls
French and Bradford Worsted Rolls
Wool Spinning Rolls

Climax Rolls are custom-made to suit your equipment and your weighting requirements.

*KERANOL nk®

gives woolens, cottons and rayons a very desireable, soft full hand...

***Durable to Washing and Dry Cleaning**

Your woolen, cotton and rayon fabrics finished with KERANOL N K will have a truly mellow, glove-like hand, durable to washing and dry cleaning. KERANOL N K is unaffected by variable pH values, so may be used with greatest efficiency in neutral, alkaline or acid baths.

Mail the coupon for further information.

Additional — and highly valuable — use of KERANOL N K: as a plasticizer and softener in conjunction with all types of resin finishes.

EXCELLENT RESISTANCE TO YELLOWING!

Arkansas Co., Inc.
184 Foundry St.
Newark, N. J.

Gentlemen:
Please send, without obligation:

- ☐ full details on KERANOL N K
- ☐ sample and application procedure
- ☐ please have representative call

NAME _____ TITLE _____

FIRM NAME _____

ADDRESS _____

CITY _____ STATE _____

3-3-1

Arkansas Co. INC.

MANUFACTURERS OF INDUSTRIAL CHEMICALS FOR OVER 45 YEARS
NEWARK, NEW JERSEY

"So you think you gals know how to shop? Well, get a load of this load of stuff!"

YES, William the Conqueror, that's quite a suit you've just bought yourself there! Nice style, fine tailoring . . . and the material is really *something!* Bet you shopped every place in town for it. Now go ahead and tell the little woman what you paid for it. She won't believe you 'til you show her the slip! Show her the label, too . . . and tell her what the salesman told you about the mill that wove that cloth.

Now let us tell you (and her) what *we* know about that mill. It's a top operation that has a weaveroom full of modern, automatic C&K Call-Box Looms that turn out so much handsome cloth *so fast* that you can now buy . . . at the price you are boasting of . . . a suit that would have been undreamed of, in your textile philosophy, not so many years ago.

Today, competition in quality enables *every* man and woman to be a smart shopper. And as long as there are progressive mills with modern C&K Weaverooms . . . kept at top operating efficiency with Certified C&K Looms Parts . . . you and your wife will continue to be the best-dressed people in any country in the world.

This "Invisible Trademark" Stands Back of the Trademarks of the World's Finest Woven Fabrics

Competition begins in the Weaveroom! . . . and that's where C&K begins your profit-with the World's Longest Line of Looms

Crompton & Knowles LOOM WORKS

WORCESTER 1, MASSACHUSETTS, U. S. A.

PHILADELPHIA, PA. • CHARLOTTE, N. C. • ALLENTOWN, PA. • CROMPTON & KNOWLES JACQUARD & SUPPLY CO., PAWTUCKET, R. I.

FOR DE-SIZING

RAPIDASE®

Heat-stabilized amylolytic enzyme preparation, liquid. Solubilizes starch sizing in cotton, rayons and mixed goods . . . at extremely high temperatures. *De-size faster at lower cost with Rapidase.*

RAPIDASE-M Intermediate strength—with all the characteristics, quality and value of Rapidase. For those who prefer a de-sizing agent of higher concentration.

RAPIDASE-CONCENTRATED For those whose needs demand a de-sizing preparation of highest unit strength. Because of its high concentration, greater economy is obtained in freight handling and storage expense.

ZYMEX®

A powdered amylolytic enzyme preparation in high concentration. For those who prefer the convenience of a powdered enzyme . . . with all the advantages and economy of Rapidase.

SEBIZYME®

Proteolytic type liquid de-sizing agent. For de-sizing fabrics containing gelatin, casein, soya and other protein and albuminous sizes. Produces a finer, softer hand, more uniform quality, clearer cross dyes.

In conjunction with any enzyme preparation . . . SACOM . . . a non-ionic wetting agent and detergent. It is compatible with enzymes and is applicable in neutral, acid or alkaline solutions.

Our technicians are available to visit your plant on request . . . Write for booklet

WALLERSTEIN COMPANY, INC. 180 MADISON AVENUE, NEW YORK 16, N. Y.

SYLVANIA® CELLOPHANE

— gives your packaging the jump on competition!

Sylvania Cellophane MS-1 in the 450 gauge makes an eye-catching glove package that's a sure sales-winner.

These are some of the properties that can help your products win sales:

1 SALES APPEAL **2 Durability** **3 Soil protection** **4 Transparency** **5 Low cost**

Visit Our Booth at the A.M.A. National Packaging Exposition, Public Auditorium, Atlantic City, April 17-20, 1951.

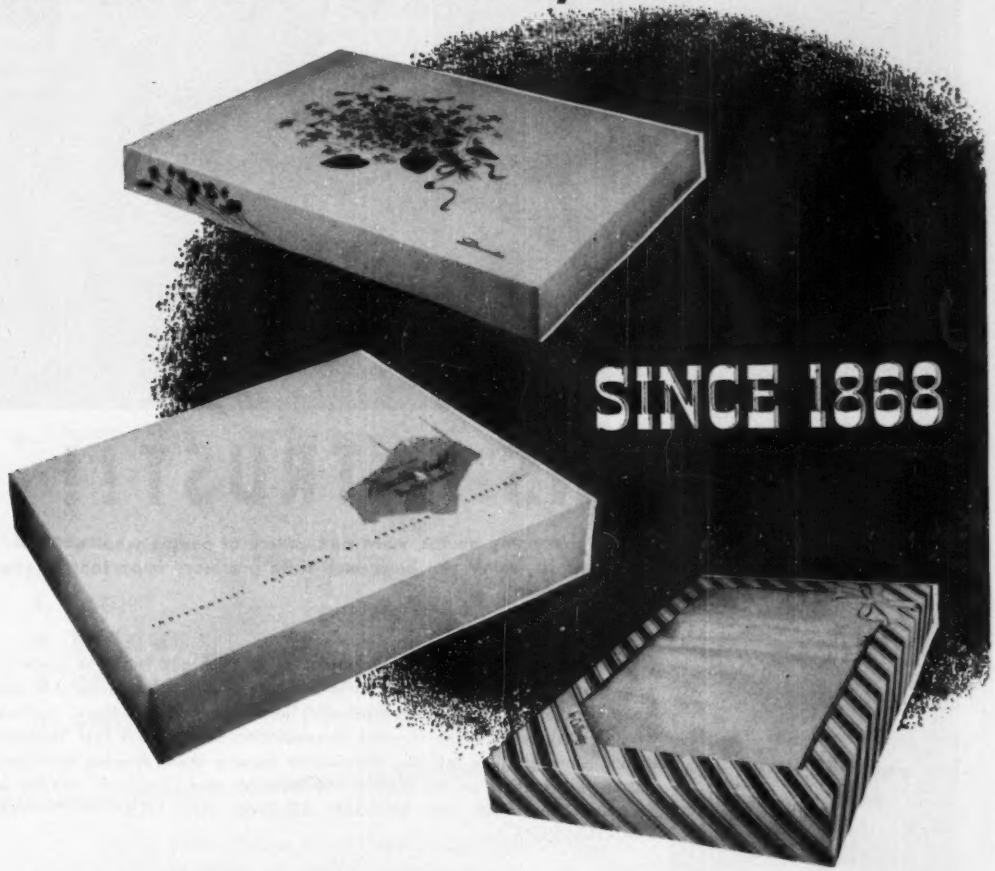
SYLVANIA® CELLOPHANE

Sylvania is always ready to help you solve your packaging problems. Discuss them with your Sylvania representative or write us mentioning the specific application in which you are interested. Address: Market Development, Dept. TI-3.

SYLVANIA DIVISION AMERICAN VISCOSE CORPORATION
Manufacturers of cellophane and other cellulose products since 1929
General Sales Office: 1617 Pennsylvania Blvd., Philadelphia 3, Pa.
Plant: Fredericksburg, Va.

The First Name in Packaging

for the Textile Industry...



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GLASSINE SPECIALTY BAGS

APACO
ESTABLISHED 1868

MILLIONS in TRUST!!

Millions of dollars are invested every day on the word and advice of people who have your confidence. Business organizations in which you have such faith are more important to you today than ever before.

RELIABLE SUPPLIER!

RELIABLE PRODUCT?

Are your suppliers' products as modern as your mill?

HERE'S WHY!

Modern "Southern" production methods assure modern belting-peak performance.

Consider for a moment your purchasing. Is the faith and trust you place in your suppliers justified? Has your leather belting supplier kept up with the many changes in the power transmission field? Users of "Southern" belting have this assurance: After 61 years of association, they KNOW that Southern Belting Company is a reliable, dependable supplier manufacturing the finest flat leather belting on the market. They KNOW that "Southern" belting is ahead of the field with MODERN BELTING FOR MODERN POWER TRANSMISSION.

BUY A PROVEN PRODUCT FROM A FIRM YOU CAN TRUST.
BUY "SOUTHERN" BELTING.

SOUTHERN *Belting* **COMPANY**

236 FORSYTH STREET, S. W. ATLANTA 2, GEORGIA

THE "SOUTHERN WAY" IS THE MODERN WAY

Reprinted from the March 1951 issue of TEXTILE INDUSTRIES

INVESTIGATE
nylon travelers

PROVE TO YOURSELF
THESE IMPORTANT ADVANTAGES

1. Higher spindle speeds.
2. More yardage on your present bobbins.
3. Much less lubricant required.
4. Less end breakage.
5. Longer life. Less down time for changing travelers.
6. Cleaner frames—cleaner rooms.

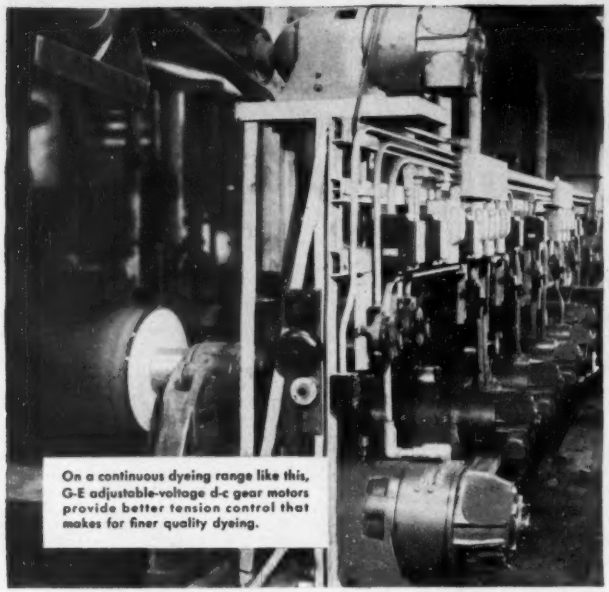
1. LIGHT
2. STRONG
3. RESILIENT
4. SMOOTH
5. TOUGH
6. EXTREMELY RESISTANT TO WEAR

Many thousands of these Nylon Travelers are in daily use—giving complete satisfaction.

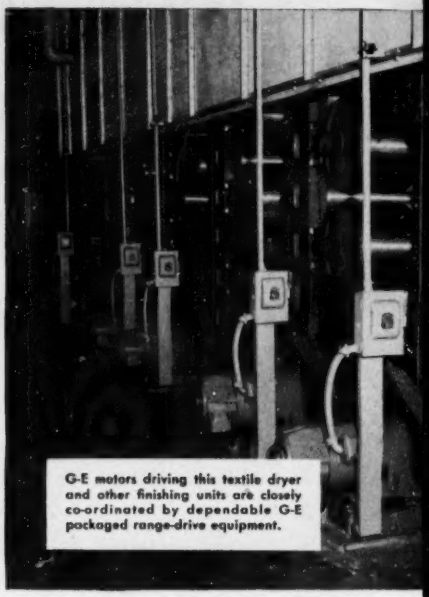
SEND FOR SAMPLES
Include Style and Depth of Your Rings and Samples of Travelers You Now Use.

MANUFACTURED BY
THE CLARK THREAD COMPANY, INC.
264 Ogden Street, Newark 4, New Jersey

SELLING AGENT
THE SPOOL COTTON CO.
264 Ogden Street
Newark 4, New Jersey



On a continuous dyeing range like this, G-E adjustable-voltage d-c gear motors provide better tension control that makes for finer quality dyeing.



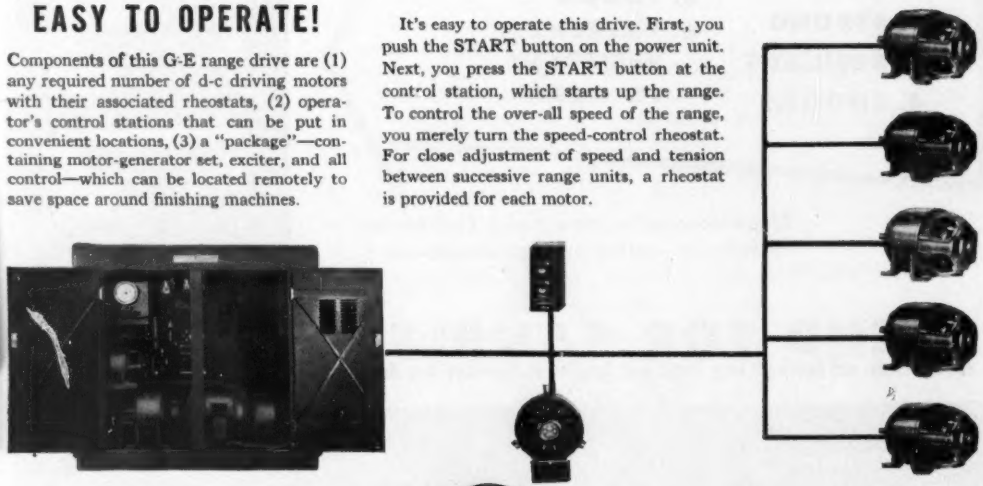
G-E motors driving this textile dryer and other finishing units are closely co-ordinated by dependable G-E packaged range-drive equipment.

Now—a Packaged

EASY TO OPERATE!

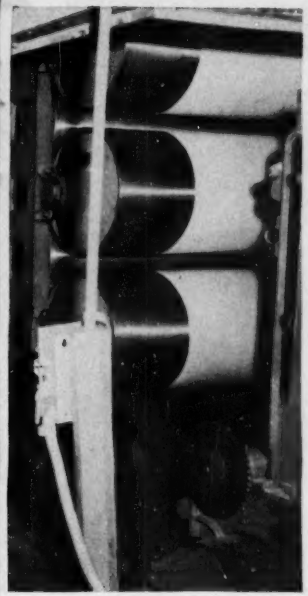
Components of this G-E range drive are (1) any required number of d-c driving motors with their associated rheostats, (2) operator's control stations that can be put in convenient locations, (3) a "package"—containing motor-generator set, exciter, and all control—which can be located remotely to save space around finishing machines.

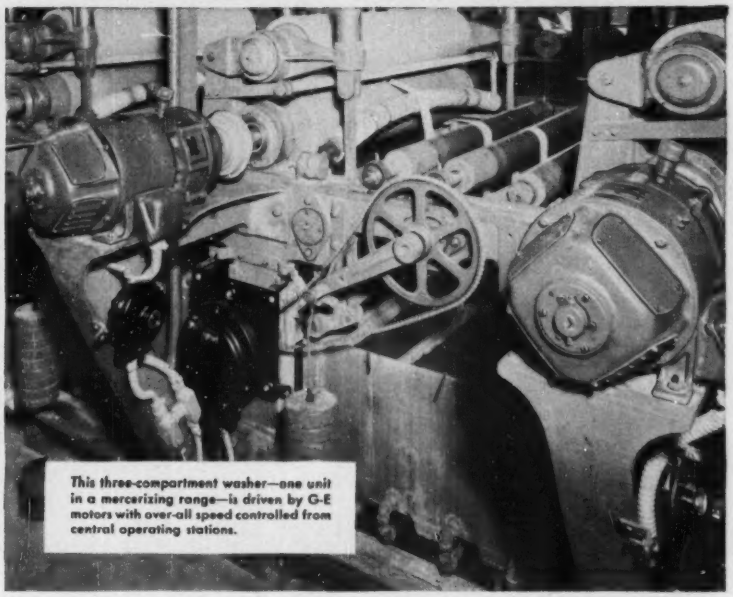
It's easy to operate this drive. First, you push the START button on the power unit. Next, you press the START button at the control station, which starts up the range. To control the over-all speed of the range, you merely turn the speed-control rheostat. For close adjustment of speed and tension between successive range units, a rheostat is provided for each motor.



GENERAL ELECTRIC

654-16





This three-compartment washer—one unit in a mercerizing range—is driven by G-E motors with over-all speed controlled from central operating stations.

G-E Range Drive

that lowers your installed cost —gives greater layout flexibility!

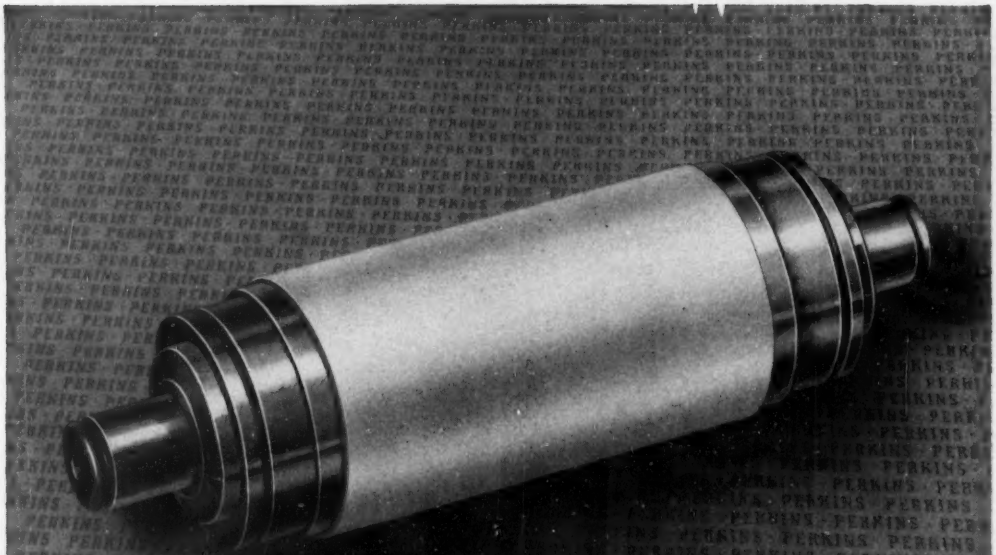
Range Drives FOR TEXTILE MILLS

See *"Textiles Unlimited,"* G-E's full-color sound movie on how textile mills are modernizing. Your G-E representative will gladly arrange a showing of this More Power to America presentation.

Here's a range drive that gives you all the advantages of the widely used adjustable-voltage d-c system of speed control—brought to you by General Electric in a mass-produced "package" of standardized parts. Now you get lower installed cost, simplified installation, and greater ease in making plant-layout changes in addition to these other important advantages:

- Any desired speed range and jogging speed.
- Easy control of over-all speed from a central location.
- Close co-ordination of speed of all motors by means of compensating gates or "soft" motors.
- Flexibility of operation because it permits individual units to be disconnected from the range.
- Dynamic braking for quick stopping, and regenerative braking for controlled deceleration, available if required.
- Maximum reliability and minimum maintenance with a simple, sturdy G-E motor at each drive unit.

If you're planning to install a complete new range, ask your machinery manufacturer about this G-E packaged multi-motor drive. If you're extending or modernizing an existing range, call in your local G-E textile-mill specialist on your drive problems. *Apparatus Dept., General Electric Co., Schenectady 5, N. Y.*



PERKINS HOLYOKE ®

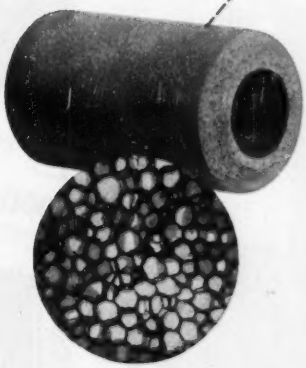
Perkins Calender Rolls—the natural result of the longest and broadest experience in the industry—give quality that is definitely reflected in your product. Perkins service includes refills of any make of calender rolls.

B. F. PERKINS & SON, Inc.

HOLYOKE, MASS., U.S.A.

LARGEST MANUFACTURERS OF CALENDER ROLLS IN THE WORLD

If you're having trouble with eyebrows try this Armstrong Cot



Here's why cork cots won't eyebrow. Millions of tiny cork cells like these (here magnified 1200 times) give cork cots their superior friction. As the yarn passes under the cot, these cells act like tiny suction cups to carry loose fibers well back under the clearer board where they cannot eyebrow and fall into the yarn.

An Armstrong's Seamless Cork Cot never permits loose fibers to accumulate at the front of the clearer board where they can eyebrow and fall into the yarn. Instead, its high-friction surface packs loose fibers well back under the clearer where they belong. Armstrong's Cork Cots in many mills also reduce clearer waste as much as 50%. This not only helps produce a stronger, more uniform yarn but also reduces the necessary amount of clearer picking to a minimum.

These high-friction cots are economical, too. Low in first cost, they can be installed with a minimum of roll shop labor. They come to you seamless and preglued, ready to slip on the roll in one simple operation. An occasional buffing is all that's needed to keep them spinning like new, and they'll give from two to three years of front line service.

Next time the Armstrong representative calls at your mill, ask him about a test installation of these cots. He'll be glad to arrange it, with no obligation to you. Write Armstrong Cork Company, Textile Products Department, 3603 Arch Street, Lancaster, Penna. Available for export.

ARMSTRONG'S CORK COTS

for high-quality spinning . . . at low cost

SUPREME opens the door to...

HERE IS THE NEW SUPREME RIB PRODUCTION STAR—

The MODEL SR

This 7"—10 Feed Machine Is Similar to the New Ribbers You Will See at Atlantic City.

SEE THE NEW SUPREME SR RIB MACHINE AT THE KNITTING ARTS EXHIBITION ATLANTIC CITY, APRIL 30th-MAY 4th. OR ASK FOR FACTORY PREVIEW.

This ad tells only part of the story. You'll see even more revolutionary technical developments when the Model SR is unveiled at Atlantic City. Knitters who want a preview can get it by making an appointment to see the new machine at the Supreme plant, right now.

SUPREME

KNITTING MACHINE CO., INC.

107 JOHNSON AVE., BROOKLYN 6, NEW YORK, N. Y.

BETTER PRODUCTION OF RIB CLOTH

SUPREME KMC

Knitting News

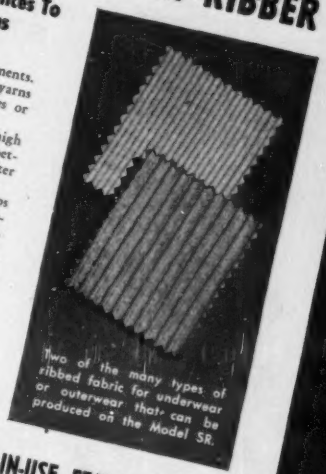
SUPREME ANNOUNCES NEW SUPER-RIBBER

New Supreme Ribber Utilizes Latest Technical Advances To Give Tremendous Production And Quality Bonus

Before buying his next machine, the ribbed cloth knitter should see how Supreme's New Model SR will improve quality and increase production. Some of the design features and exclusive knitting advantages that can be revealed prior to the showing are listed below.

1. Single action, micromatic, dial-elevating and lowering adjustment gives accurate and uniform stitch adjustment at the flip of a finger. Knit as tight or loose a stitch as desired.
2. Sturdy, dogless, tripod construction eliminates pinch lines and insures alignment of all elements. Simplified, instantaneous synchronization of dial to cylinder needles.
3. An exclusive, new, simple method for speedily converting from plain to swiss rib.
4. Individual, channeled cams lock needles in proper position and eliminate smash-ups. Knitter can remove a section and replace it without having to realign needles by hand. Thickness of cams provides large bearing surface for long wear, easier cleaning and less accumulation of dirt.
5. Large open areas around cylinder and dial assure easy cleaning, inspection and maintenance. Greater space between knitting feeds allows easy access to cloth and needles at knitting level.
6. The SR knits a wide range and variety of yarns with uniform quality and a minimum of adjustments. Weak or slubbed yarns will not cause damages or interrupt production.
7. Produces cloth of high elasticity. This assures better shape retention after processing and washings.
8. Automatic control stops machine when predetermined roll size is completed.
9. Roller bearing thrust for entire center drive. Overhead gear-driven dial with center spindle of special alloy steel, hardened and ground.

The new Supreme Model SR will be available in sizes ranging from 7" diameter—10 feeds to 30" diameter—44 feeds.



Two of the many types of ribbed fabric for underwear or outerwear that can be produced on the Model SR.

SUPREME'S PROVEN-IN-USE FEATURES HELP GIVE NEW RIBBER 32 YD. PER HR. OUTPUT AT 100% EFFICIENCY

Supreme's entirely new line of high-speed circular rib knitting machines includes many of the revolutionary production-improving features which have made Supreme's circular jersey machines so successful.

These production-boosting features include:

- *Stationary Yarn Stand*—Permits greater RPM of the cylinder, dial and knitting elements system; lets the knitter use double cone system with "pig-tail" double tieups. Assures faster stopping and starting . . . greater safety and efficiency.
- *Revolving, Floating Take-Up and Roll-Up* — Interwinding, roller-bearing supported. Uniform tension assures large, even and compact cloth rolls. Independent support prevents wear on cylinder and outer ring.
- *Unit Motor Drive*—Rugged, smooth-running. Patented multi-disc clutch gives almost instant start and stop. No slippage. Smooth, silent chain drive unaffected by lint or dust.

The nation's rapidly expanding defense program will demand from you the fullest use of your productive capacity. In spite of almost certain shortages of skilled labor and raw materials with resulting delays in the procurement of new machinery . . *TOP PRODUCTION* must be maintained

To keep the Whitin machines in your mill operating at peak efficiency . . . *use only*

WHITIN REPAIR PARTS

Around-the-clock schedules at top speed are pretty rough on machinery. Breakdowns are costly. Proper maintenance is a necessity — and proper maintenance implies having replacement parts in stock *before* breakdowns occur.

The Whitin machinery in your mill is scientifically designed, carefully built precision equipment. It must be obvious that satisfactory replacement parts for this machinery can come *only* from Whitin.

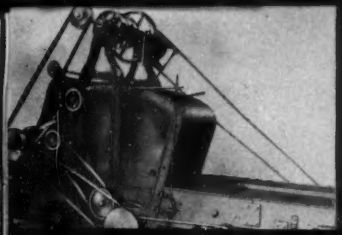
Whitin's facilities in both Charlotte and Whitinsville have been expanded and improved to bring you the best in Repair Service.

Our Repair Service is always at your disposal. We hope that you will avail yourself of its many unusual advantages.

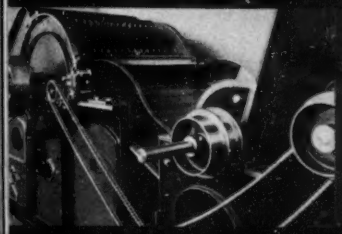
Whitin MACHINE WORKS

WHITINSVILLE, MASSACHUSETTS

CHARLOTTE, N. C. • ATLANTA, GA. • SPARTANSBURG, S. C. • DEXTER, ME.

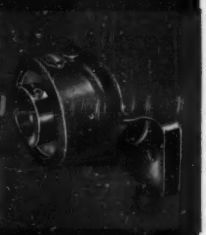


Bottom Apron Unit - Bale Breaker



Beater Box Unit

Lifting Apron Unit



Picker Fan Box Unit

Apron Adjusting Bracket

Fafnir Wide Inner Ring Bearing with Self-locking Collar, easiest of all to install

TURNING POINTS
to lower costs
in Opening, Cleaning and Picking

Right from the start of your mill operations, Fafnir ready-to-mount textile ball bearing units can save you money. For example, on Vertical Openers where bearing loads are high, Fafnir ball bearings ease the load, lighten wear, increase belt life, remove the fire hazard of dripping oil and maintain the general overall efficiency of the machine.

You can get Fafnir Textile Units in such a wide variety of types that no vital turning point need be without the benefits of anti-friction bearings. Because these units are designed for specific points on specific machines . . . bale breakers, hoppers, blending feeders, pickers, etc., . . . you'll find their installation easy and fast. What's more, practically all units have the Fafnir Wide Inner Ring Ball Bearing with self-locking collar, easiest of all to install.

Get acquainted with the complete Fafnir Textile Line and its possibilities for lowering your costs of production. Send for the latest catalog on Textile Units. The Fafnir Bearing Company, New Britain, Conn.

Other FAFNIR UNITS for Opening Cleaning Picking

- LAK Type Pillow Block
- Frame and Take-Up Unit
- Lifting Apron Unit — Saco-Lowell F5 Feeder
- Idler Cone Unit — for P & D Evener
- Adjustable Lifting Apron Unit — No. 4 Saco-Lowell Bale Breaker
- Evener Cone Unit — Saco-Lowell Picker
- Lifting Apron — Saco-Lowell F5 Feeder
- Slat Conveyor Roll Unit — Saco-Lowell Opening Room Equipment
- Side Shaft — Saco-Lowell Picker
- Apron Adjusting Bracket — Saco-Lowell Lattice Conveyor
- Apron Adjusting Bracket — Saco-Lowell Blending Reserve
- Breaker Shaft Unit — No. 4 Saco-Lowell Bale Breaker
- P & D Evener Unit — Saco-Lowell Picker
- Box-worm Gear — Top Cone Shaft P & D Evener
- Unit-Doffer Beater for Kitson Hopper
- Calender Rack Assembly Units

FAFNIR
BALL BEARINGS

MOST COMPLETE LINE IN AMERICA

How you save time and money with

Pittsburgh CARGOTAINERS

Substitute Pittsburgh Cargotainers for your old-time handling equipment and you'll find they rapidly pay for themselves in man-hours. Cargotainers are designed to move through every mill operation without unloading and reloading. They are easily moved with lift truck or dolly — they stack or fold — and are ruggedly built for either temporary or permanent storage. Cargotainers are open-mesh so that the contents are always easily identified by color and type . . . moreover old tags and other foreign matter drop through without accumulating in the bottom. For complete information on how these patented collapsible welded-wire baskets with eight-way pallet bases can simplify your handling problem, write without obligation to Pittsburgh Steel Products Company, Department TI, Grant Building, Pittsburgh 30, Pa.

Pittsburgh Steel Products Company

A Subsidiary of Pittsburgh Steel Company

SANDOZ PRESENTS *The color achievement of the month*

Cloud Grey ...BY MOHAWK

That most fleeting of substances — the cloud — belies its own tendency when representing one of the high-fashion colors used for Mohawk's Grosvenor pattern.

For colors such as Cloud Grey, Mohawk Carpet Mills, Inc., demands utmost resistance to fading. And that is why Mohawk includes Sandoz among its suppliers.

Such Sandoz colors as the following are widely used by carpet mills because they are exceptionally level-dyeing even in light shades, highly resistant to color change during mill processing, and as impervious to light, wear and cleaning as ever a color could be:

BRILLIANT ALIZARINE LIGHT BLUE 3F

XYLENE FAST RED 6BL

XYLENE FAST RUBINE 3GP

XYLENE LIGHT YELLOW 3G

And for *any* chrome, acid or direct dyes . . . or auxiliary chemicals . . . for both natural and synthetic fibres . . . be guided by the successful "color achievements" you see in these Sandoz advertisements.

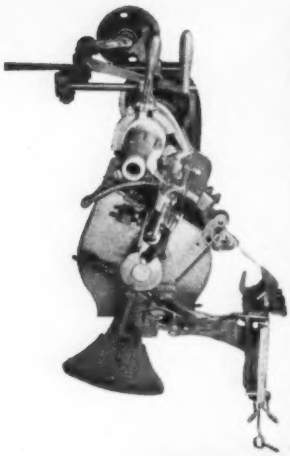
DIRECT-DYE COTTON AND RAYON WITH CONFIDENCE IN WASH FASTNESS!

New Sandoz CUPROFIX colors and after-treatment give fastness to washing, light, etc., that formerly required more expensive vat dyeing. Write for booklet on CUPROFIX, already adopted by dozens of mills.

SANDOZ CHEMICAL WORKS, INC., 61 VAN DAM STREET, NEW YORK 13, N. Y.

Application laboratories and stocks at Boston, Philadelphia, Charlotte, Chicago, Los Angeles, Toronto • Other branches at Providence, Paterson and Montreal

S N *thinks ahead with textiles* S

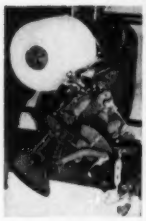


You are looking at the

Most Flexible Winding Spindle

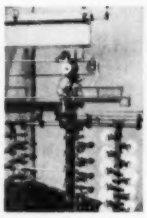
in the industry

This basic spindle unit of the No. 50 Universal Precise Winder is used . . . not only to wind more than 90% of the world's coned synthetic yarn . . . but also to produce a wide *variety* of special work that is only hinted at on this page.



WINDING CREPE WITH MAGNETENSION

This device utilizes a magnetic field to provide constant, smooth tension, eliminating excessive peaks or loss of tension control caused by any uneven delivery from supply package.

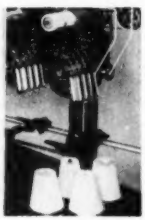


WINDING MULTIPLE ENDS FOR WIRE INSULATION, ETC.

Packages containing up to 30 ends are wound in perfect tape form from packages of previously-inspected yarn. Individual stopping mechanisms for each end permit tying single strands, avoiding "bunch" knots.

WINDING DYE TUBES OF SYNTHETIC YARNS

This Ray-Silk attachment winds synthetic yarn with a minimum amount of applied tension and pressure to produce soft tubes for uniform dyeing.



WINDING YARN FOR COVERING RUBBER

Here, two tubes per spindle, two ends per tube, are being wound for a rubber covering machine. Covered rubber yarn in skein form is then wound onto pineapple cones for the next operation.

WINDING THREAD ON BOBBIN SPOOLS

Large compact packages to deliver thread overend for the cutting trade are wound with this attachment equipped with automatic visible counter. A similar attachment winds the so-called "miniature" bobbin spool.

WINDING PINEAPPLE CONES OF NYLON

To put nylon into the best delivery form for full-fashioned, tricot, and circular knitting, the No. 50 Pineapple Coner with emulsion attachment is used, winding from tubes previously sized on the Universal No. 250B Single End Sizer.

WINDING 3° 51' CONES

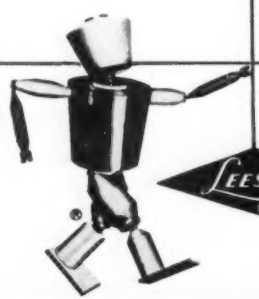
The large diameter of this cone increases production upwards of 12%. It is especially suitable for fine denier nylon because it delivers with more uniform tension on the knitting machine.

WINDING TWO OR MORE COPS

Two or more small packages per spindle can be wound with individual paraffin attachment, tension and stopping mechanisms. For example: three cops each 3½ in. long can be wound on one spindle.

WINDING HAND KNITTING SKEINS

Skeins of home knitting yarn are wound on No. 50 Winders equipped with special electrical attachments for automatically stopping all six spindles simultaneously at the predetermined yardage.



UNIVERSAL WINDING COMPANY

Universal Division

P. O. Box 1605, Providence 1, R. I.

Boston, Philadelphia, Utica, Charlotte, Atlanta, Chicago, Los Angeles; Montreal, Hamilton, Canada; Manchester, England; Paris, France; Basle, Switzerland

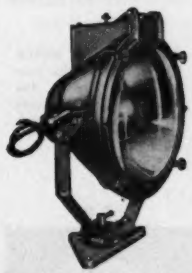
Agents in every principal textile center throughout the world

Winding and Twisting Machinery for Natural and Synthetic Yarns

Light! ... for PROTECTION

Type DCX-18 Searchlight

Type ADE-14 Floodlight



Type LCE-1120 Floodlight

America is faced with the ever-present danger of sabotage that would cripple vital services and production facilities. Sabotage thrives in darkness. The most reliable and cheapest form of protection against night prowlers is LIGHT!

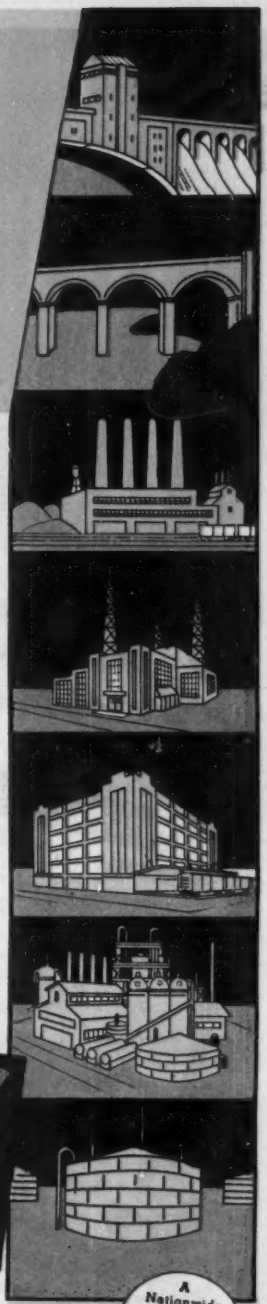
CROUSE-HINDS Floodlights

project powerful beams of light that bathe all approaches to your property with glaring radiance, killing darkness and shadows and compelling everyone to be more visible at night than in broad daylight.

The protective power of light should be used in all important municipal and industrial locations, including waterworks, dams, pumping stations, gas works and gas storage tanks, electric power plants and substations, factories, mills, mines, bridges, docks, warehouses, railway terminals, tunnels, shops and freight houses, canal locks, and aqueducts, oil refineries, pump houses and storage tanks, telephone and telegraph stations, radio stations.

The floodlighting of industrial plants serves a double purpose. It helps to boost production in addition to the security it provides.

Crouse-Hinds offers a complete line of floodlights and searchlights that will meet the needs of any type of protective lighting. Crouse-Hinds illumination engineers have a wealth of protective lighting knowledge that is at your service. Send for your copy of Bulletin 2565, "LIGHT! Protect Your Property."



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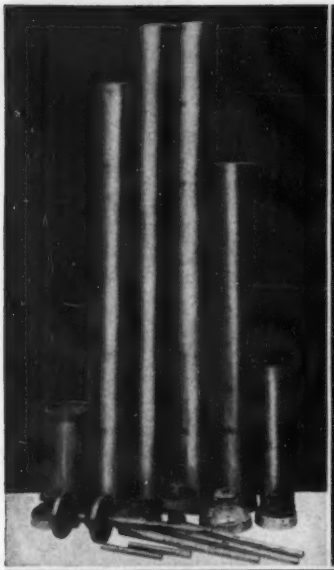
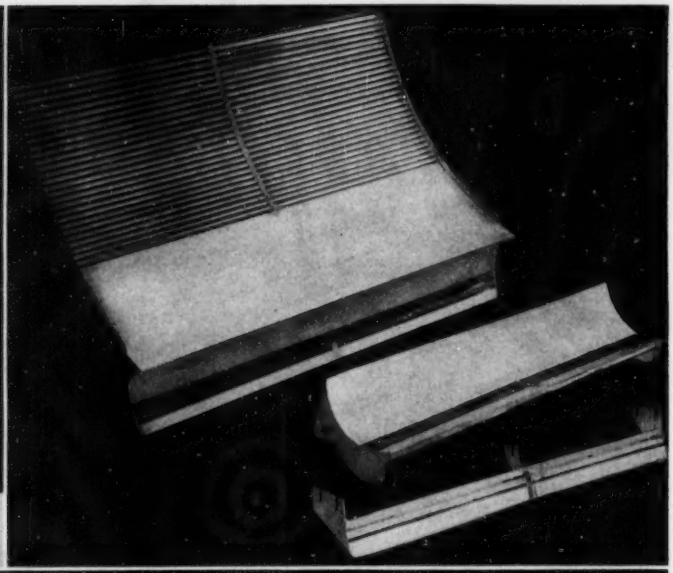
CROUSE-HINDS COMPANY OF CANADA, LTD., TORONTO, ONT.

A Nationwide Distribution Through Electrical Wholesalers

FLOODLIGHTS · AIRPORT LIGHTING · TRAFFIC SIGNALS · CONDULETS





Cylinders to fit any frame-

SCREENS for any CARD

SIMS CHECK LIST FOR REPLACEMENT PARTS

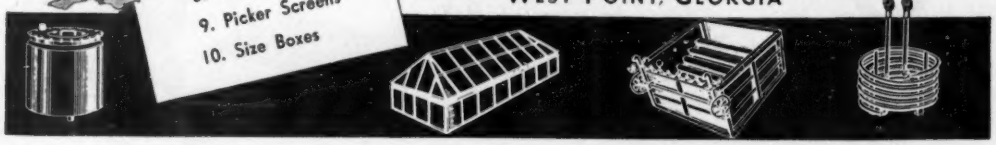
1. Pipe Coils—of every shape, in any metal or alloy
2. Dry Cans
3. Slasher Hoods
4. Rolls—fluted or plain
5. **SPINNING CYLINDERS**
6. **SPINNING CYLINDER HEADS AND ARBORS**
7. **CARD SCREENS**
8. Slasher Cylinders
9. Picker Screens
10. Size Boxes

Rough and battered spinning cylinders cannot produce strong, even yarns. Nor, going further back, will worn card screens produce even laps. These important pieces of equipment, so essential to top grade textile production, are frequently neglected. Sims replacement parts stock includes cylinders, heads and arbors for any make of frame and screens for any type card. Sims is also equipped to repair reusable equipment. For proper sliver deposit, even lap and strong yarns, inspect carding and spinning equipment, then call Sims.

Sims METAL WORKS

WEST POINT, GEORGIA

Get the Sims CHECK LIST habit — check your equipment against the stock replacement parts list at left. It's a money-saving habit.

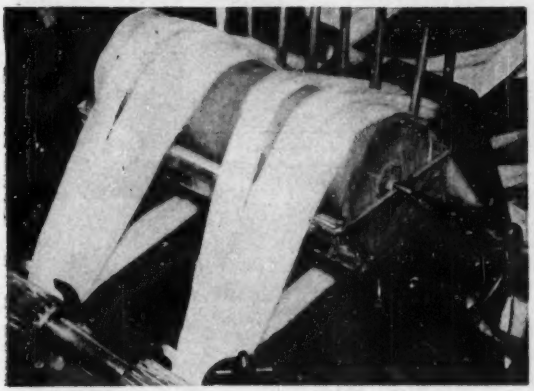


the FEW extra ¢ents that make a LOT of sense

When it comes to producing worsted yarn, there is always this important question: Should a spinner spend a few more cents than absolutely necessary when processing top, to try and achieve more efficient production and better finished products? In the case of Nopco* 1656-R, the answer is "yes".

Today, the price of top is the highest in history. Thus the few additional cents involved in the purchase of Nopco 1656-R become insignificant in the face of over-all costs. Moreover, the unique advantages afforded by this remarkable oil far outweigh its price differential when compared to alternatives. Just consider:

NOPCO* 1656-R...



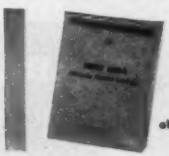
*Reg. U. S. Pat. Off.

1. ***provides excellent lubrication and eliminates static in worsted sliver. Result: no fly from top treated with this oil—fewer ends down in spinning and winding—much less brush waste;***
2. ***increases the drag, and thereby gives a better draft—resulting in more even and cleaner yarn;***
3. ***scours out with phenomenal ease—actually converting into suds when used with alkali, polyphosphate and water;***
4. ***applies equally to all production systems—American, Bradford or French—and is extremely advantageous on pin drafters.***

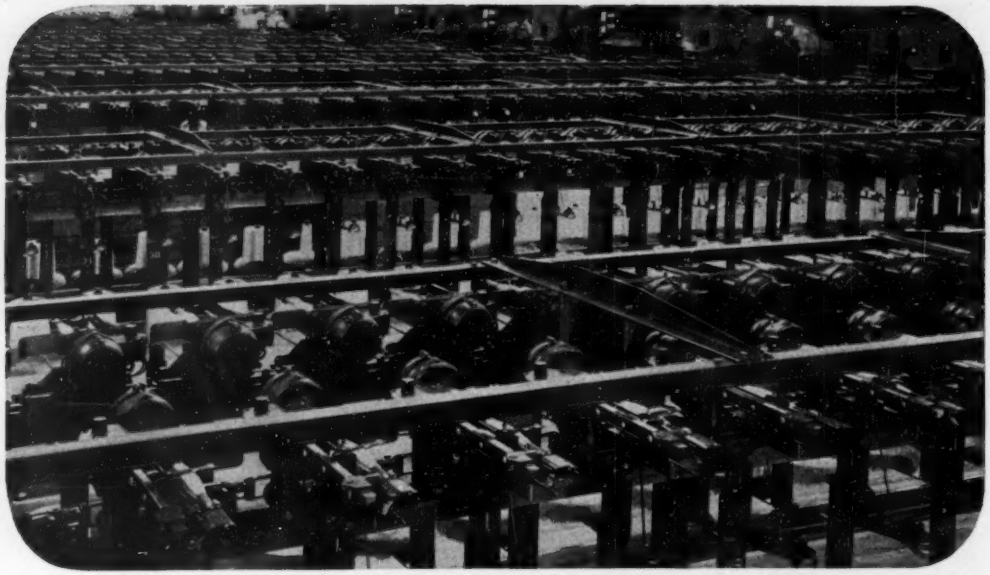
Yes, it will profit you to use Nopco 1656-R wherever you employ a lubricant in your top-processing procedure. And it will profit you to specify Nopco 1656-R, as a number of spinners already do, whenever you purchase oil-combed top. You'll pay a few more cents above "rock bottom" perhaps, but when you examine your finished yarns, you'll know you have produced high quality products with surprising economy.

NOPCO
INVOLVED THRU RESEARCH

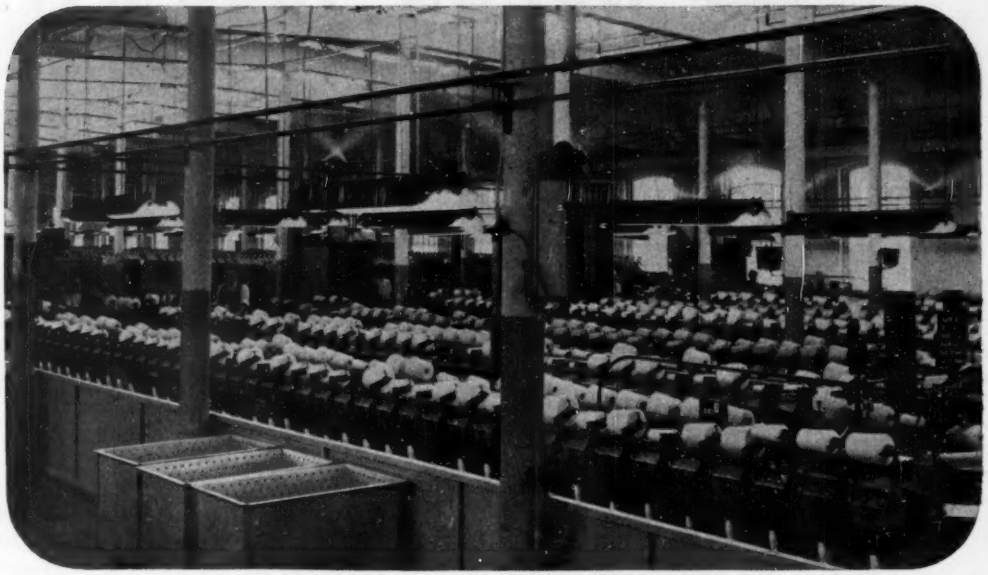
NOPCO CHEMICAL COMPANY
HARRISON, NEW JERSEY
Branches: Boston, Chicago, Cedartown, Ga., Richmond, Calif.



Send for your FREE copy of this bulletin giving detailed information about Nopco* 1656-R



ABBOTT AUTOMATIC QUILLERS PRODUCE MAXIMUM PRODUCTION PER OPERATOR AT LOWEST COST. 1000 TO 2000 BOBBINS OF WOUND FILLING PER HOUR PER OPERATOR.



ABBOTT AUTOMATIC WINDERS REQUIRE ONLY ONE OPERATOR PER MACHINE. 800 TO 1000 BOBBINS WOUND ONTO CONES OR CHEESES PER HOUR PER WINDER.

ABBOTT MACHINE CO., INC.

WILTON, NEW HAMPSHIRE

SOUTHERN OFFICE, GREENVILLE, S. C.

CONDENSERS

ACCURACY
EXTREME LIFE

ALSIMAG

A TYPICAL CUSTOMER COMMENT:

"The best condenser guides we had been able to buy wore out in a few hours. The AlSiMag 491 Guides which you furnished us have not yet worn beyond our tolerance allowance."

High speed, high tension and pressure result in great wear on condenser guides. In addition, close tolerances on hole sizes must be maintained.

AlSiMag Condensers have solved both these problems in hundreds of mills.

If you will test AlSiMag Condenser Guides in your mill we believe you too will find them more accurate and far longer lived than any other condenser guides of comparable cost. AlSiMag 491 Guides cost about one-fifth as much as guides of tungsten-carbide or other extremely hard alloy steels. Mill records indicate that in many cases AlSiMag 491 lasts at least ten times longer. Thus, in many applications, for 1/5 the cost you can get as much as 10 times the service.

Samples from our file will be sent free on request. Samples hand made to your specifications can be furnished at reasonable cost.

AlSiMag Condensers are made in two materials, AlSiMag 192 (8 on Mohs' scale) and AlSiMag 491 (9 on Mohs' scale). • AlSiMag 192 Condensers are less expensive and in most cases will fully meet requirements of rayon, nylon, cotton and wool yarns. • AlSiMag 491 Condensers are indicated for unusually abrasive processes. 491 Condensers are widely and successfully used in processing jute, paper, fibre glass and monofilaments. • In either 192 or 491, hole sizes can be economically maintained within ± 0.001" in holes larger than 0.0625" diameter and not more than 0.375" in length. All AlSiMag guides are custom made.

49TH YEAR OF CERAMIC LEADERSHIP

AMERICAN LAVA CORPORATION

CHATTANOOGA 5, TENNESSEE

OFFICES: METROPOLITAN AREA: 671 Broad St., Newark, N. J., Mitchell 2-8159 • CHICAGO, 228 North LaSalle St., Central 6-1721
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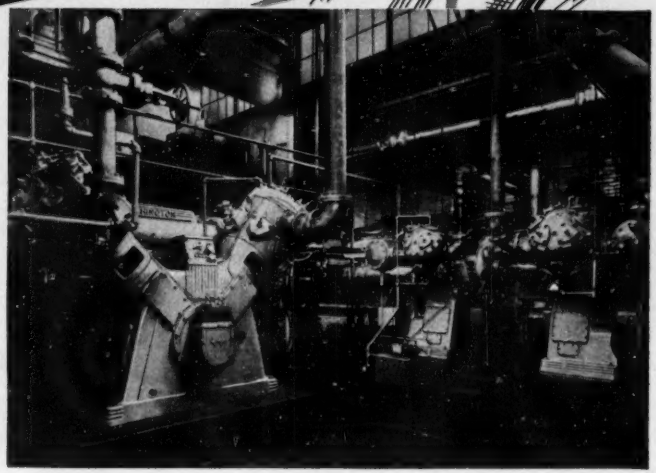
IN 30 MONTHS OF STEADY OPERATION!



Three Worthington YC-2 Compressors on general air service in the Reo Motors Company Plant, Lansing, Michigan. Two of these units ran for 2½ years, the other (a later installation) for 2 years, before all three had their first routine examination. During that time they operated approximately 16 hours per day, 5 days per week, without a single shutdown for maintenance.

Worthington YC-2 Compressors Provide Reo Motors Plant With Trouble-Free, Low-Cost Air Service

Freedom from maintenance worries is just one of the many advantages you get with Worthington YC-2 Compressors. Installation is quick, easy and inexpensive. A YC-2 comes completely assembled — there's no alignment problem and you don't need an erecting engineer. Requiring only half the space and one-quarter the foundation of same-capacity horizontals, it's ready for work as soon as connections are completed — at big savings in time, labor and money.

You get steady savings on operating costs, too, thanks to advanced features like the balanced Y-frame for higher rpm . . . the power-thrifty, instantly responsive 3 and 5-step variable capacity control . . . and Worthington Feather* Valves, most efficient and economical ever made.

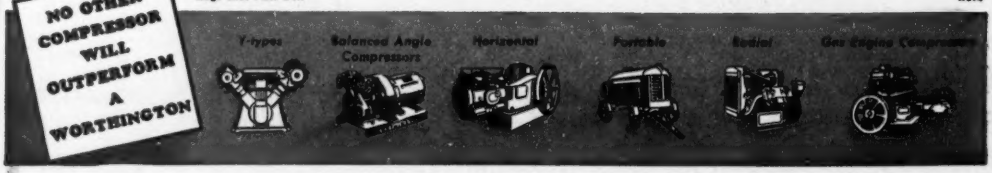
GET ALL THE FACTS

on how YC-2's can cut your air costs — from the first day on! Bulletin L-667-B1A gives you the whole economy story with further proof that *there's more worth in Worthington*. Write to *Worthington Pump and Machinery Corporation, Compressor Division, Buffalo, New York.*

WORTHINGTON

NO OTHER COMPRESSOR WILL OUTPERFORM A WORTHINGTON

*Reg. U.S. Pat. Off.



Gulfspin keeps spindles clean!

Here's why:

1. Resists formation of sludge

2. Prevents sludge from depositing on spindle surfaces

Spindle blades and bolsters stay clean when they are lubricated with the new Gulfspin.

Here is the important reason! Gulfspin not only has the inherent ability to resist the formation of harmful sludge, but also prevents sludge from depositing. And during periods when oil levels are low, Gulfspin's protective film insures against the formation of rust. Thus the need for costly cleaning of spindles and bolsters is eliminated—parts wipe clean easily.

Gulfspin has excellent oiliness characteristics. It reduces the rate of bolster wear experienced with ordinary oils, insures freedom from spindle wobble.

Gulfspin, unlike conventional spindle oils, does not appreciably increase in viscosity even after extended use. This accounts for reports from users telling of substantial savings in power costs.

See for yourself—on your frames—that this new spindle oil is better in every way. Or write today for copy of a pamphlet on this outstanding new oil.

Gulf Oil Corporation · Gulf Refining Company
Gulf Building, Pittsburgh 30, Pa.

FIFTY YEARS OF SERVICE
1901 GULF 1951
PETROLEUM AND ITS PRODUCTS

HIGHLIGHTS of a MODERN DYE BECK

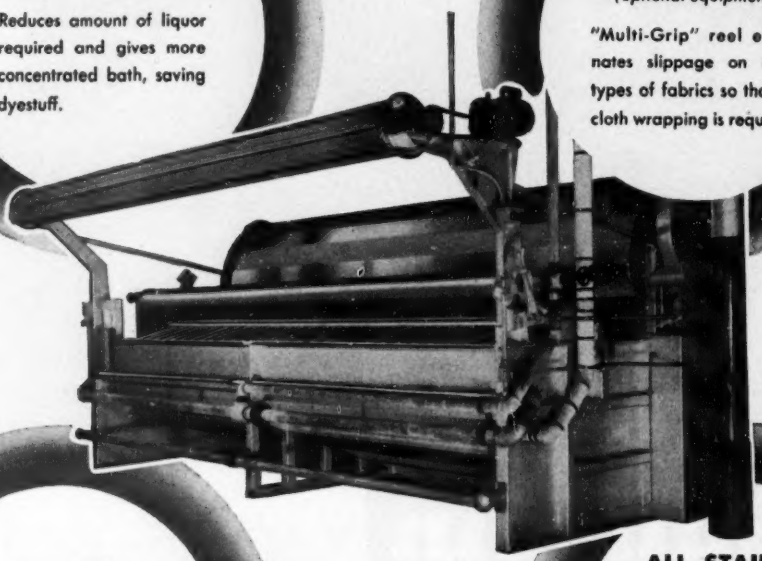
BETTER DYE LIQUOR RATIO

Reduces amount of liquor required and gives more concentrated bath, saving dyestuff.

DRUM TYPE REEL

(optional equipment)

"Multi-Grip" reel eliminates slippage on most types of fabrics so that no cloth wrapping is required.



ROUND BOTTOM

Minimizes tangles and tie-ups, promotes free ballooning of cloth and reduces tension to a minimum.

ALL STAINLESS STEEL

Large capacity (up to 40 strings), all stainless steel tub makes for quick color changes, high volume production and long machine life.

The Fleet Line

STAINLESS STEEL DYE BECK

Further information on Request

RIGGS AND LOMBARD, INC.

FOOT OF SUFFOLK STREET, LOWELL, MASS.

The Fleet Line — A complete line of modern equipment to successfully handle present day wet-finishing, carbonizing and dyeing requirements.

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Thomaston Cotton Mills, Inc., Georgia, use Gates Vulco Ropes on the multiple V-Belt drives of the ply twisters shown in the photograph. In this application, the Gates Vulco Ropes have been averaging 31,200 hours of service—the equivalent of 13 years at 8 hours a day.

This Simple Test Tells WHY the Concave Sides of Gates Vulco Ropes Mean *Longer Belt Life!*

Prove this *yourself*—in two minutes' time.

Take any V-belt that has *straight* sides. *Bend* that V-belt while you grip its sides between your fingers and your thumb. You will *feel* the sides of the belt *bulge out*—as shown in figure 1-A, below.

Clearly, that outbulge forces the sides of the belt to press *unevenly* against the V-pulley—and this concentrates the *wear* where the bulge is greatest.

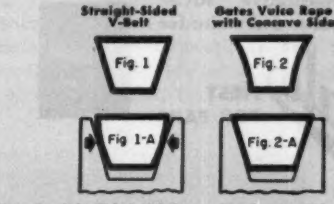
Now, make the same test with the belt that is built with the Concave Sides—the Gates Vulco Rope.

Figures 2 and 2-A show clearly what happens when you bend a Vulco Rope. Instead of *bulging*, the precisely engineered Concave Sides merely *fill out* and become perfectly straight. There is no side-bulge. This belt, when bent, precisely fits its sheave groove.

Because there is *no bulging*, the sides of the Gates Vulco Rope always grip the *full* face of the V-pulley *evenly* and therefore wear *uniformly*—resulting in *longer belt life* and *lower belt costs for you.*

Only V-belts made by Gates are built with concave sides. Whenever you buy V-belts, be sure that you get the V-belt with the Concave Sides—The Gates Vulco Rope!

What Happens When a V-Belt Bends



How Straight-Sided V-Belt Bulges in Sheave-Groove. Sides Press Unevenly Against V-Pulley Causing Extra Wear At Point Shown by Arrows.

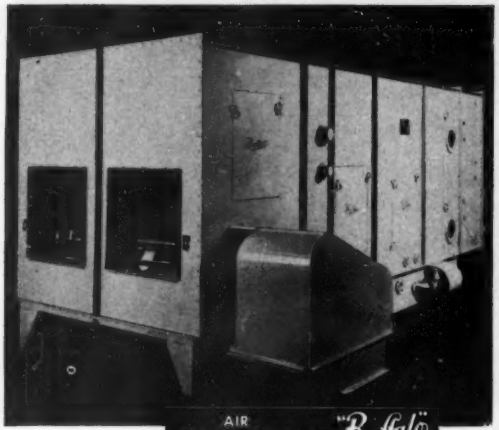
The Concave Sides Fill Out to a Precise Fit in the Sheave-Groove. No Side Bulge! Sides Press Evenly Against the V-Pulley—Uniform Wear—Longer Life!

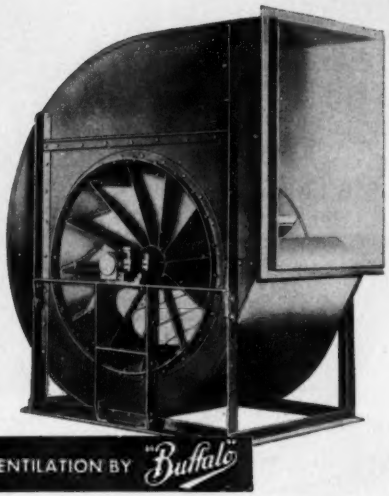
CS-511

THE GATES RUBBER COMPANY
DENVER, U. S. A.
The World's Largest Makers of V-Belts

Gates VULCO ROPE DRIVES
Engineering Offices and Jobber Stocks IN ALL INDUSTRIAL CENTERS of the U. S. and 71 Foreign Countries

Which is your best buy?





"Buffalo" Can Advise You Without Bias . . .

Generally, the more you want done with your plant air, the more you need some form of air conditioning. Thorough dust control, humidifying, cooling call for one of the several types of "Buffalo" Air Washers. General comfort conditioning, including heating, cooling and air cleaning call for PC Cabinets. Have a "Buffalo" Engineering Representative advise you, for best results, and write for Bulletin 370²

"Buffalo" FIRST FOR FANS

Often, for comfort or process control, ventilation will do the job. You can exhaust hot, stale air from a working area, or blow in fresh air. Moreover, air circulation by itself has a cooling effect. BULLETIN 3675, below, describes the widely used "Buffalo" Limit-Load Fan, your most efficient method of ventilating large areas. WRITE FOR YOUR COPY, and find out from your nearby "Buffalo" Engineer the many ways you can put ventilation to work in your plant!

FAN ENGINEERING, 5th Edition, gives you 808 pages of authoritative facts on air and its uses. A convenient pocket-size manual, a reference widely used by the industry. Order NOW! $6.00 Postpaid in U. S. A.

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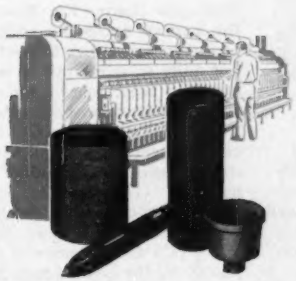
175 MORTIMER ST. BUFFALO, NEW YORK
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.
Branch Offices in all Principal Cities

In vital places in the textile industry

micarta is basic!



TEXTILE INDUSTRY

Bobbins, shuttles, spools and lap rolls are typical of MICARTA products which are vital elements in textile production. Its tough, light, long-wearing qualities offer infinite possibilities in the growing textile industry.

MICARTA® helps keep key machines productive. It is a basic material . . . a versatile plastic which outlasts metal and wood in many punishing applications. Bobbins, shuttles, spools and lap rolls are only a few of the many MICARTA products paying their way in your industry.

MICARTA safeguards yarns and fabrics. It won't chip or splinter. It wears evenly and smoothly, absorbs shock and vibration, resists heat and cold.

This lighter-than-aluminum material can be machined, formed or molded easier and more economically than metal. Protect your vital applications with MICARTA. Westinghouse Electric Corporation, MICARTA Division, Trafford, Pennsylvania. J-06448

THIS IS NO. 85 OF A SERIES ON

GETTING THE MOST FROM TWISTING

Information about twisting designed to show improvements in twisting equipment and new ideas in the twisting operation

TWISTING DIFFERENT YARN CONSTRUCTIONS ON THE SAME MACHINE Atwood Model 10 Ring Twister

In many mills twisting a large number of different yarn constructions in small lots, the amount of yarn being processed for any one construction may not be enough to require all the spindles on both sides of the twister, leaving some spindles inoperative.

There is, therefore, a definite advantage in being able to produce a different number of turns on the two sides of the frame, because more spindles can be kept producing, thus increasing output and lowering costs. This is particularly true if the mill has a small installation of twisters.

The insertion of different turns of twist on each side of the Atwood Model 10 Ring Twister has been made possible through the design of a new set of twist gears. By means of these gears, the Model 10 can be set to produce from .663 to 3.000 as many turns per inch on the driven side of the frame as on the driving side.

The *driving* side of the ring twister is the one on which the twist change gear (A in Fig. 1) is in mesh with the driving gear (B). The side on which these gears mesh varies, depending on whether "S" or "Z" twist is being inserted.

The gearing to produce the desired number of turns on the *driving* side is established first. This is done by using the standard formula:

$$\frac{\text{CONSTANT}}{\text{Turns per inch}}$$

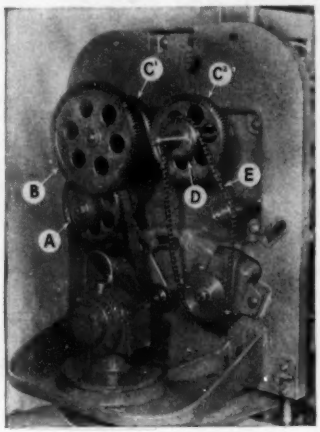


Fig. 1 Head end of Atwood Model 10 Ring Twister showing twist gearing. Twist gears (C) can be changed to run a different twist on each side of the machine.

This determines the twist change gear to be used.

Next step is to determine the twist gears (C in Fig. 1) that will produce the desired twist on the *driven side*. The ratio is :

$$\frac{\text{Turns per Inch (Driven Side)}}{\text{Turns per Inch (Driving Side)}}$$

Once the ratio is found, the proper twist gears can be located by referring to a Supplementary Twist Gearing Table (see "Twists and Winds No. 84," available upon request).

Example It is desired to produce 3½ turns per inch on the driving side and 4½ turns per inch on the driven side. The constant is 200.22. Dividing the constant by 3.50 indicates that a 57-tooth twist change gear is required to produce 3½ turns per inch on the driving side. The ratio of turns per inch driven side to turns per inch driving side is:

$$\frac{4.5}{3.5} = 1.286$$

Referring to the Supplementary Twist Gearing Table, it will be found that the nearest ratio to 1.286 is 1.301, and that this ratio can be obtained by using a 73-tooth twist gear (C^1) on the driving side and a 95-tooth twist gear (C^2) on the driven side. The actual turns per inch obtained on the driven side with this combination is 1.301 x 3.5 or 4.55 turns per inch.

Since the twist gears (C) are located on fixed centers, the ratio between the supplementary twist gears necessarily has to be confined to that which will allow the gears to mesh properly within a fixed distance between the two feed gear shafts. For this reason, the various turns per inch which can be inserted with this set-up are not quite so numerous as with the standard twist gearing for running the same twist on both sides.

The twist gears (C) can be changed easily and quickly. The driving gear (B), builder driver sprocket (D), and roller chain (E) are removed from the feed gear shafts. This allows the twist gears (C) to be removed and replaced by the gears which give the desired number of turns on each side of the frame, following which the parts removed from the feed gear shaft, are placed back in position.

February 1951

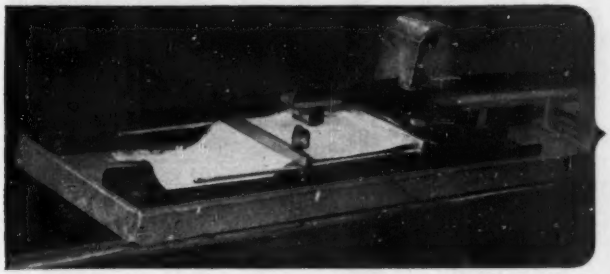
WINDING AND TWISTING MACHINERY FOR NATURAL AND SYNTHETIC YARNS

UNIVERSAL WINDING COMPANY

Atwood Division

PROVIDENCE BOSTON PHILADELPHIA UTICA CHARLOTTE ATLANTA CHICAGO LOS ANGELES MONTREAL and HAMILTON

Fewer seconds...fewer rejects with **Syton** for SLIPPAGE CONTROL



United States Testing Co. Inc. slippage control tester in use at Monsanto's Textile Chemical Department Laboratories.

Now you can put a sub-microscopic, anti-slip "tread" on smooth, slippery filament yarns with Syton alone or as part of the finishing formula. In many cases, practically 100% reduction in slippage is obtained in filament fabrics. Syton is a colloidal silica dispersion which is applied on the pad, on the jig, or in the final rinse following a wash. It's stable and compatible with a wide variety of finishing agents.

Anti-Slip Agent in Wet Processing: Many finishers use Syton to control slippage in some low-end constructions in scouring, dyeing and finishing.
Delustering Effects are achieved with larger concentrations of Syton alone or in conjunction with pigment dullers.
Crisp, Dry Finish and a pleasing, "worsted-like" hand is obtained with Syton on spun viscose-acetate or rayon-wool fabrics.
Special Effects on Cotton, Wool, Synthetics: Desirable effects are obtained with Syton on nylon marquisettes, rayon linings, satins, taffetas, ribbons, and Fiberglas fabrics.
Added Functional Effects include snag resistance, anti-blocking, adhesion and seam strength.

SERVING INDUSTRY...WHICH SERVES MANKIND

MONSANTO CHEMICALS—PLASTICS

New, free technical bulletin

on "Syton in Textile Finishes" may be obtained with the coupon.

For full information on Syton*, and other Monsanto textile chemicals such as Stymer*, for rayon slashing; Merlon* resins for durable finishes; Resloom*, for washability and wrinkle resistance; Sterox*, Sted*, for cleansing and scouring; Catalyst AC for curing melamine and urea resin finishes; Dye fixatives; Rezgard*, fugitive-type flame retardant—check and return the coupon.

MONSANTO CHEMICAL COMPANY, Textile Chemicals Dept., Desk TIT 32
Everett Station, Boston 49, Mass.

- ☐ Please send me the technical bulletin, "Syton in Textile Finishes."
- ☐ Please send me information on: ☐ Syton ☐ Sterox ☐ Stymer ☐ Merlon ☐ Sted ☐ Resloom ☐ Catalyst AC ☐ Dye fixatives ☐ Rezgard

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Company _____

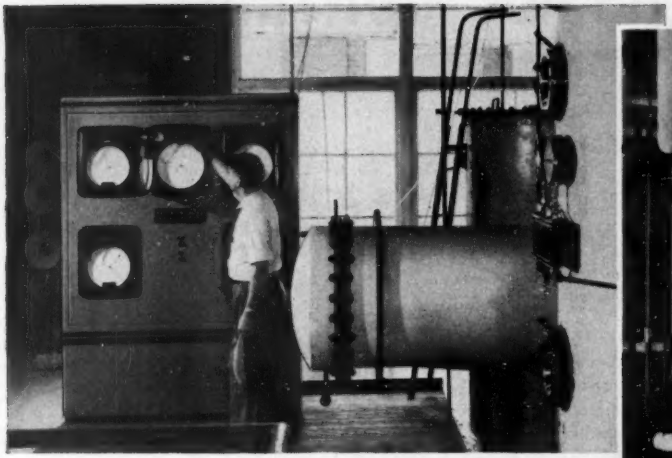
Address _____

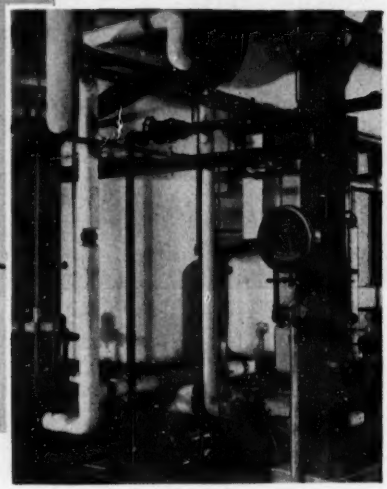
City, Zone, State _____

*Reg. U. S. Pat. Off.

It's here!...

AUTOMATIC EVAPORATOR CONTROL





THE FIRST KNOWN AUTOMATIC EVAPORATOR CONTROL for textile processing (shown above) was installed in the American Thread Company's Kerr Mill at Fall River, Mass. It was designed for Zaremba Evaporators. Careful estimates indicate that this Foxboro Cabinet Control system will pay for itself in less than a year through new, overall economies.

A New Opportunity to Modernize Another Important Textile Process

By adapting the basic principles of successful evaporator control to textile processing, a far more efficient means of reclaiming caustic is made available. Through accurate, coordinated control of variables, this latest Foxboro development improves caustic reclamation three ways... it increases evaporator capacity and saves caustic, thus cutting costs; it helps to reduce stream pollution, and it eliminates routine checking, manual controlling and record writing.

Textile Machinery and Mill men worked closely with Foxboro engineers in developing this important new automatic control system. Such cooperation frequently leads to important processing advances and this is no exception. For complete information on the new automatic evaporator control, contact your nearby Foxboro Field Engineer or write, **The Foxboro Company, 483 Neponset Ave., Foxboro, Mass., U. S. A.**

5 OUTSTANDING FUNCTIONS

1. *controls caustic concentration automatically by electronic comparison of solution's boiling point to boiling point of water at the same pressure... a unique method on Foxboro systems, known as "boiling point rise" control—*

2. *accurately measures steam flow and weak liquor flow to indicate efficiency of evaporators for better maintenance—*

3. *controls liquid level of make-up caustic tanks—*

4. *measures the percent of caustic in steam condensate and condenser hot water leaving evaporator... and—*

5. *automatically diverts these to sewer if caustic content rises above safe limits.*

FOXBORO
Reg. U. S. Pat. Off.

Process-Improving Controls
FOR THE TEXTILE INDUSTRY

DOUBLE DISC MODEL—one type for 10 to 140 grams; one for 100 to 300 grams

A Kidde Compensator

CAN SOLVE YOUR TENSION PROBLEMS

Kidde engineers, specialists in textile tensions, have designed three compensators to eliminate the variables in yarn tensioning.

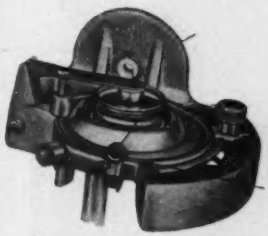
The Double Disc Model maintains constant tension at high speeds hitherto thought impossible. It passes knots without yarn breakage and is excellent for tender, high twist yarns.

The Standard Model is for average speeds and tensions. It is useful in quilling as well as in twisting and doubling, particularly with cottons and rayons, warping of rubber yarns, winding of narrow fabric bobbins.

The Warp Model is inexpensive enough to control every end economically. It is small, easily installed and avoids uneven tensions at the warp beam which may result in excessive spoilage and, in extreme cases, beam buckling.

For information on any of these Kidde compensators, fill in and send the coupon below.

STANDARD MODEL—6 to 120 grams



WARP MODEL—up to 20 grams

Walter Kidde & Company, Inc.
390 Main Street, Belleville 9, N. J.

Kidde

Walter Kidde & Company, Inc.
390 Main Street, Belleville 9, N. J.

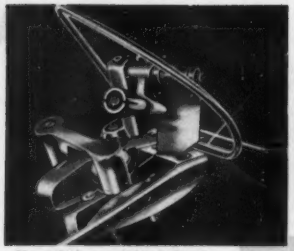
Gentlemen:
Please send me additional information on the Kidde Compensators.

Name_____

Company_____

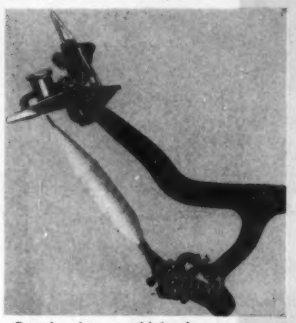
Address_____

City_____ State_____

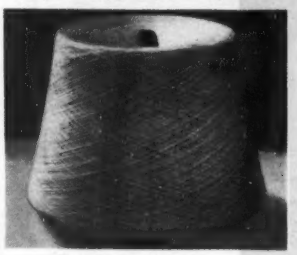


Type 51 A — self threading tension and slub catching attachment.

Easy doffing. Package holder swings out.



Supply skewer which always swings back into place after doffing.



Typical worsted cone.

6 ADVANTAGES YOU WANT *in a wool and worsted winder*

Here are six things which you (or any mill man) want in a wool and worsted winder and which can be obtained with a Foster Model 102.

1 **HIGH PRODUCTION.** This machine will produce twice as much as an obsolete model, being capable of winding speeds up to 700 y.p.m. (One mill that we know of is running 80's worsted at 400 y.p.m.). It can be built to wind 7" traverse packages, if desired.

2 **LOW OPERATING COST.** Approximately ⅓ less than that of obsolete models. Labor saving features include self threading tension devices, easy doffing, efficient knock-off mechanism, and a supply skewer for single mule spun yarns which always swings back into place and prevents a mule cop from jumping off; it also permits a single balloon which reduces breakage.

3 **LOW MAINTENANCE AND REPAIRS.** A specially trained mechanic is not required to maintain this machine or make changeovers. Hardened steel or porcelain parts minimize cutting and grooving by hard twist yarns. Repair costs run as low as $3.50 per year per 100 spindle machine.

4 **A GOOD PACKAGE.** Angle of wind may be varied between 9° and 18° by means of simple gear changes. Thus, the *correct* angle of wind for any given type or count of yarn is obtainable, and firm, well shaped packages are assured. Yarn may be conditioned, if desired.

5 **A CLEAN YARN.** Our Type 51-A Tension and Slub Catching Attachment will break out slubs or other imperfections. Thus, burling and mending costs are materially reduced.

6 **FLEXIBILITY.** In case the types of yarn you produce change, angle of wind and taper on Foster Model 102 may be changed accordingly, to handle any kind and count of staple yarn and to produce warping cones, knitting cones, parallel tubes, short traverse tubes, or dye packages.

Send for Bulletin A-95.

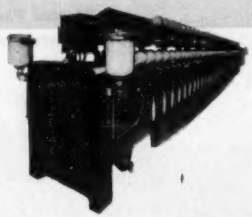
FOSTER MACHINE CO.

Westfield, Mass., U.S.A.

Southern Office: Johnston Bldg., Charlotte, North Carolina; Canadian Representative: Ross Whitehead & Co. Ltd., University Tower Bldg., 660 Ste. Catherine Street, West, Montreal, Quebec; European Representative: Muschamp Taylor Ltd. Manchester, England.

FOSTER MODEL 102

The Flexible Winder



FOR COTTON, MERCERIZED, WOOL, WORSTED, MERINO, SPUN SILK OR SPUN RAYON YARNS

Crisp and magnetic colors

can transform a simple frock into a Cinderella Gown.

For colors that make price tags unimportant, always specify

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Puts your sales on a cash basis
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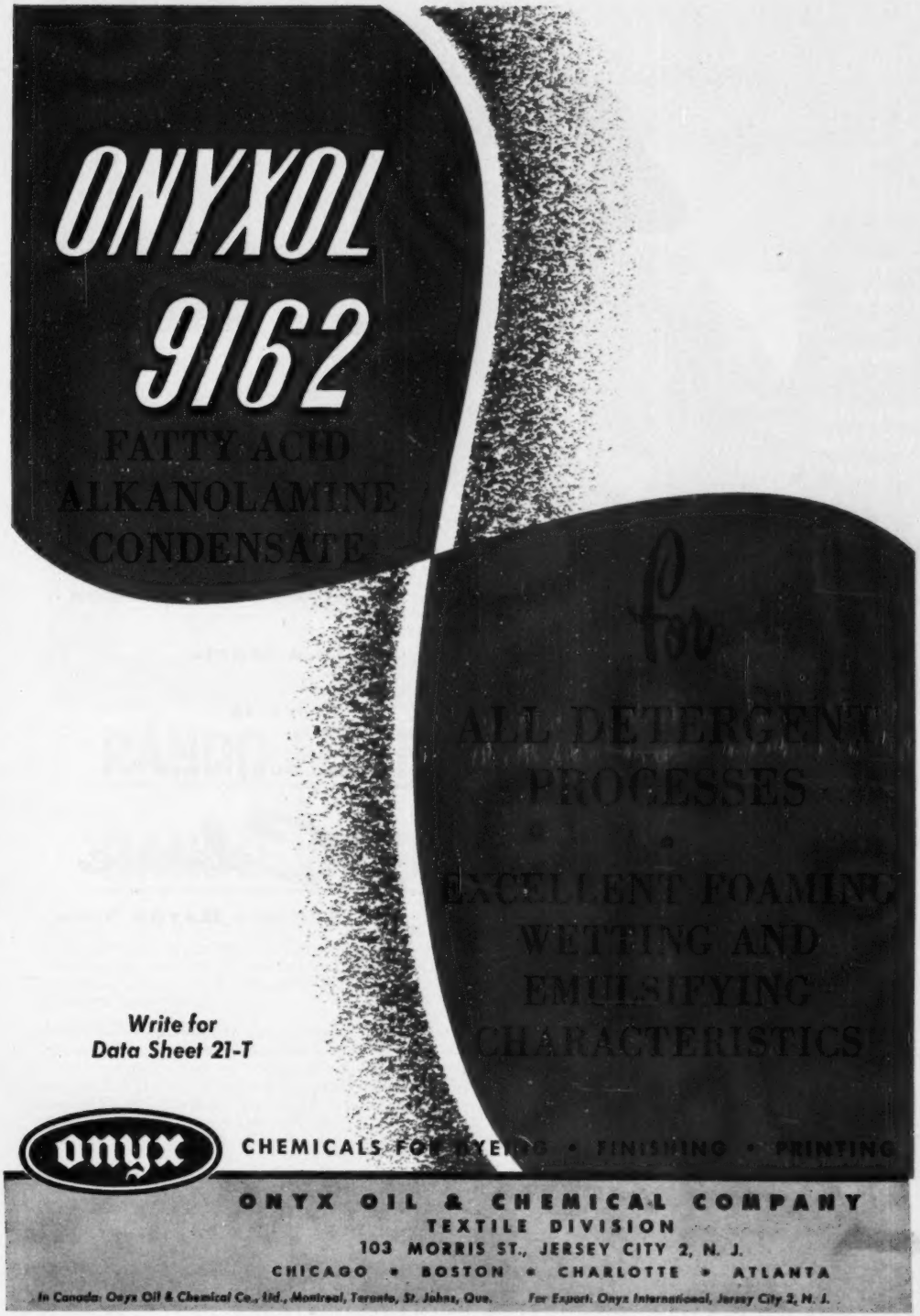
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Where quality
is the
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in a fabric
there is
no substitute for

Celanese®

Acetate Rayon Yarn

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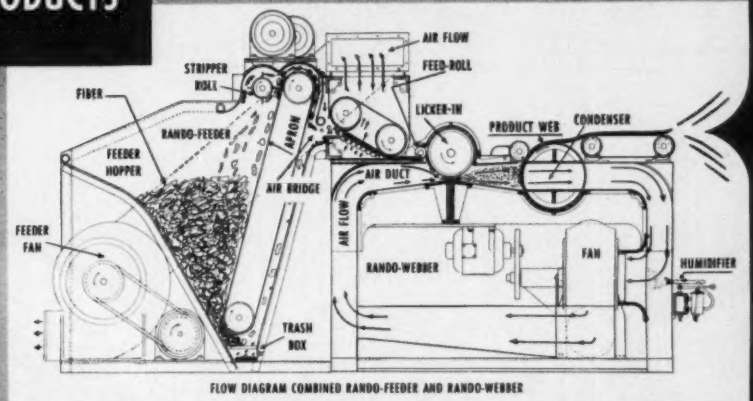
CELANESE CORPORATION OF AMERICA, 180 MADISON AVENUE, NEW YORK 16, N. Y.

NEW APPROACH TO NEW TEXTILE PRODUCTS

This Amazing Machine Lays a Uniform Random Web from Waste Fibers



FLOW DIAGRAM COMBINED RANDO-FEEDER AND RANDO-WEBBER

HEAVY MATS • WADDING • INDUSTRIAL NON-WOVEN FABRICS • FELTS • HOUSEHOLD NON-WOVEN FABRICS

*T.M. Reg. Curlator Corp., Rochester, N. Y.

RANDO-FEEDER* AND RANDO-WEBBER*

In order that a wide variety of low cost, short staple waste fibers be processed into a random web they must first be uniformly fed, lengthwise and crosswise, into a machine, such as a RANDO-WEBBER. The RANDO-FEEDER meets these needs.

RANDO-FEEDER. In operation the fiber is transferred from the feeder hopper on the pins of an apron, past a stripper to an air bridge. Fiber is carried over and pulled as needed into a wedge-shaped opening between screen and roller conveyor forming a uniform, compact feed for the RANDO-WEBBER. Excess fiber returns to the hopper while tramp metal and other heavy trash are deposited in the trash box as neither will cross the air bridge. The feed of the web machine and screen section operates as a unit. Increasing speed automatically increases output of feeder.

RANDO-WEBBER. The mat of fiber developed by the RANDO-FEEDER is fed directly to the high-speed licker-in. Fibers are doffed from licker-in teeth into air stream in the throat of a Venturi-like duct, and deposited on a rotating circular condenser screen. Speed of screen determines web thickness. Web is carried from screen in continuous flow by rubberized belt conveyor.

TURN YOUR WASTE FIBERS INTO $$$'s.

Write for new Random Web Process Bulletin 101 and for a demonstration of the processing of your fibers.

TEXTILE DIVISION
CURLATOR
CORPORATION
ROCHESTER 10, NEW YORK

Curlator Corporation, Textile Division
504 Blossom Road, Rochester 10, New York

- ☐ Please schedule a demonstration
- ☐ Please make up samples from my own waste
- ☐ Please send Random Web Bulletin 101

NAME .....
COMPANY .....
ADDRESS .....
CITY .....

UNUSUAL *Automatic System* HAS 200 CARRIERS TRAVELING BY GRAVITY

Handles and Stores Empty Hosiery Trucks

WHAT THE SYSTEM HAS ACCOMPLISHED

1 Time spent pushing and handling hosiery trucks has been drastically reduced.

2 Large storage warehouse which would be required for storing the trucks is saved because overhead ceiling space is now used for this purpose.

3 If it were not for the Tramrail System, a new building addition would probably have been necessary.

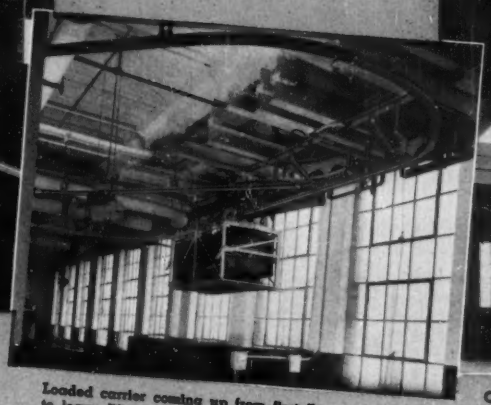
4 An elevator on which the trucks formerly were taken from the first to third floor has been relieved of work that formerly taxed its capacity.

5 The cost of an additional elevator which would have been necessary to take care of additional trucks required because of greatly increased output, was saved.

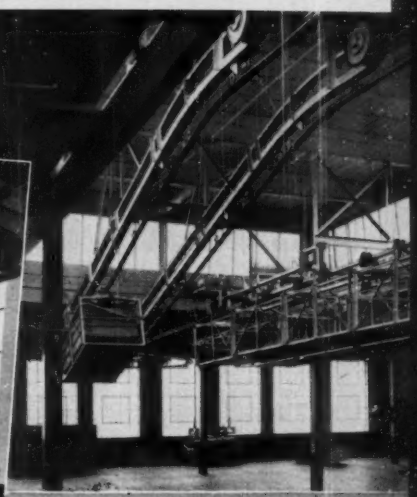
6 Costly maintenance formerly required because of hosiery truck castors wearing floors has been largely eliminated.

7 The system introduced an efficient means of handling the trucks, expedited their delivery, and greatly cut the costs of this work.

Loading station on first floor. Two empty hosiery trucks are elevated to third floor on each trip. Depressing pushbutton (on wall) starts carrier up and on its way. As soon as it has cleared lift section D on third floor, another empty carrier comes down to this position automatically.



Loaded carrier coming up from first floor and about to leave lift section D. The carriers have no motors or other propelling drives. They are equipped, however, with centrifugal brakes to prevent excessive speeds.

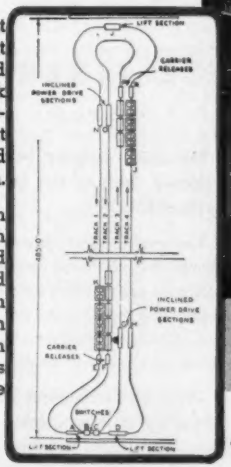


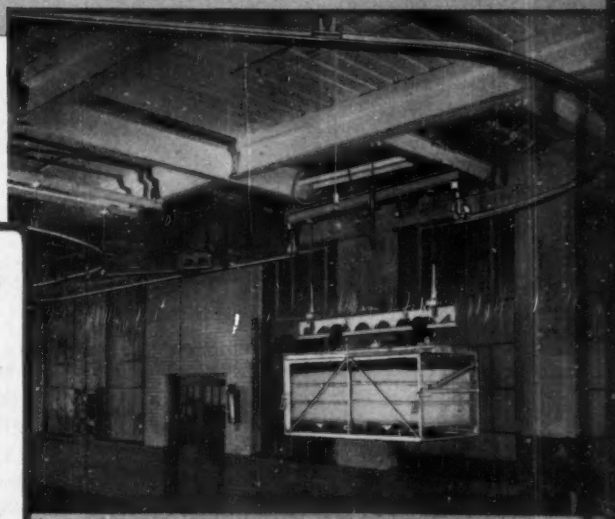
Carrier being taken up to high end of track 4 on inclined power drive section H. This carrier has just left lift section D.

A CLEVELAND Tramrail system at Hanes Hosiery Mills Company, Winston-Salem, North Carolina, producers ladies' nylon and rayon hosiery, is unique because while is entirely automatic in operation, its 200 carriers run by ravity. The carriers convey and store empty hosiery trucks, ndling two at a time.

The trucks are carried from the first or to the third floor on a lift section at (see sketch) and travel by controlled ravity down track 4 and return on track on which they are stored until re-ired. Trucks in storage are released at section A, but also may be released by stopping carriers passing through.

After the trucks in a carrier have been noved at A, the carrier travels through witches B and C, down track 3 and urns on track 2, where it is stored til needed on the first floor. As soon a loaded carrier is dispatched from first floor and leaves lift section D on third floor, another carrier comes wn and takes its place, ready for more pty hosiery trucks.





Lowering a carrier at lift section J where trucks will be pushed out on floor. The section will then be raised so that it interlocks with stationary track and carrier will continue on its way automatically.

Only seven motors are required for the entire system. These operate the three lift sections and the four inclined power drives which convey the carriers to the high ends of tracks. This is one of many types of Cleveland Tramrail automatic dispatch systems now in operation in a number of Textile Mills.

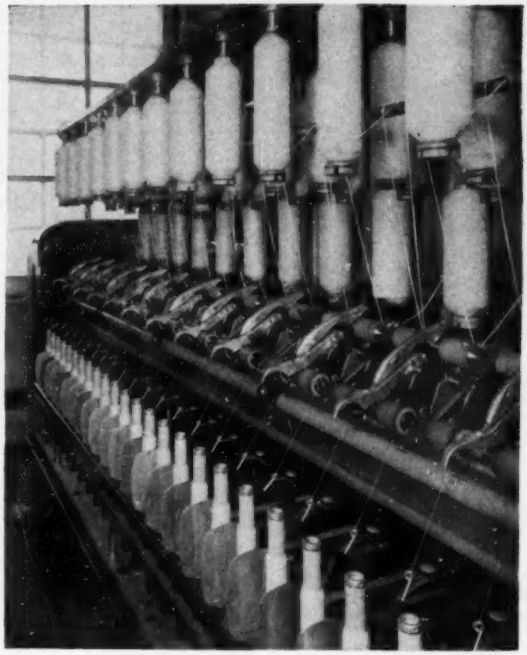
GET THIS BOOK!
BOOKLET No. 2008. Packed with valuable information. Profusely illustrated. Write for free copy.

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
2867 EAST 287th ST. WICKLIFFE, OHIO

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

THE

H & B
CASABLANCAS S-3 SYSTEM
for Spinning Synthetics and Blends

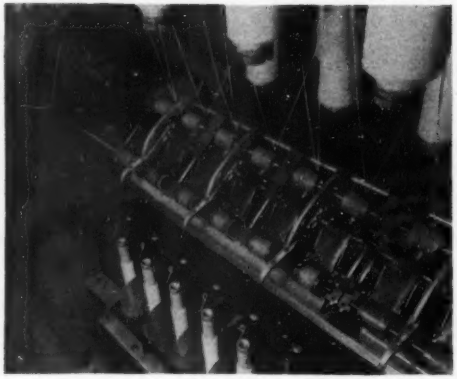


First introduced at the American Textile Machinery Exhibition last May, the H & B Casablancas S-3 System for synthetic fibers is now developed to a high degree of operating efficiency. The system features:

- *an extra, wide roll stand*
- *new interlocking saddle*
- *independent traverse motion*
- *new cap bars*
- *large cradle assembly*

The most important new S-3 feature is the wide roll stand which allows roller settings to accommodate fibers up to 3" in length. Changing the roll stand involved a new design of draft gearing, gear box and cover. The entire drafting element is mounted in a cross girt, which with the new gearing gives greater strength to the entire system.

Offers Flexibility
AND COMPLETE FIBER CONTROL



The newly designed interlocking saddles are spring weighted. Pressure can be released by merely lifting up the saddle.

The cradle design provides for the important interchangeable platforms for different staple lengths. These platforms are mounted inside the bottom apron. They are clean, easy to insert and are marked for quick identification. Changing platforms for different staple lengths involves no change of cradles, belts or roll settings.

The H & B Casablancas S-3 System utilizing a combination of apron length, tensor opening and platform position, offers great flexibility along with complete fiber control regardless of staple length.

Contact an H & B Sales Engineer for complete details on this new spinning system for synthetic fibers.

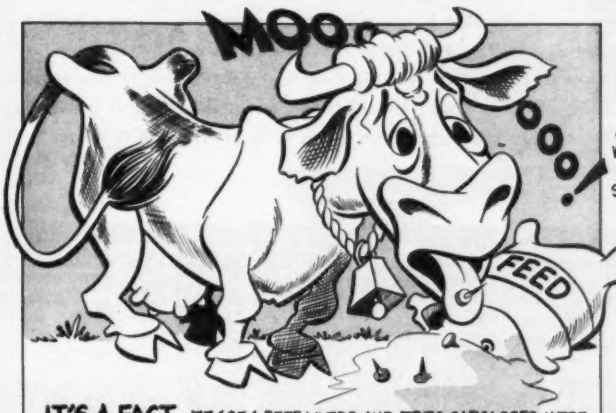
H&B AMERICAN MACHINE CO.

FACTORY, EXECUTIVE OFFICES AND EXPORT DIVISION - PAWTUCKET, R. I., U. S. A.
Branch Offices: Atlanta, Ga. — 815 Citizens and Southern National Bank Bldg.
Charlotte, N. C. — 532 West 4th Street
Greenville, S. C. — 1316-11 Woodside Bldg.

Builders of MODERN TEXTILE MACHINERY

ERIEZ MAGNETIC ATTRACTIONS

ERIEZ MANUFACTURING CO, ERIE, PA., U.S.A. • PRODUCERS OF MAGNETIC SEPARATORS AND SELLERS OF (RCA) ELECTRONIC METAL DETECTORS



IT'S A FACT... 734,254 BEEF LIVERS AND 5956 CARCASSES WERE CONDEMNED IN A YEAR BECAUSE OF ABSCESS AND PERICARDITIS CAUSED BY ***TRAMP IRON*** IN CATTLE FEED LOSS...OVER 3 MILLION DOLLARS! ***ERIEZ ATOM***AGNETS FIGHT THIS BECAUSE THEY WON'T LET TRAMP IRON PASS.

TO KEEP THE WALLS UP THEY USED ***ERIEZ*** PERMANENT PLATE MAGNETS IN GRAVITY FLOW CHUTES AT AN OHIO CHEMICAL PLANT. WITHOUT THIS PROTECTION FROM TRAMP IRON SPARKING, EXPLOSIONS WERE SO FREQUENT.... 9 A DAY AVERAGE.... THAT THE WALLS WERE MADE TO FALL OUTWARD AT THE SLIGHTEST BLAST TO AVOID MAJOR DAMAGE!

..... SINCE INSTALLATION ..... **NO EXPLOSIONS!**

YOU DON'T HAVE TO BEAT THIS DRUM ...FOR RESULTS. THE ***ERIEZ*** MAGNETIC *DRUM* AUTOMATICALLY REMOVES STRAY IRON.... SOME DANGEROUS TO MACHINERY..... SOME THAT CAN BE SOLD. *USED IN EVERY INDUSTRY!*

FIVE DOLLARS SAVED A YEAR FOR EACH DOLLAR INVESTED... THE RESULT OF ***ERIEZ*** MAGNETIC HUMP SEPARATOR INSTALLATIONS AT A SOUTHERN TEXTILE PLANT...***WOODSIDE MILLS.*** AVERAGE NUMBER OF FIRES *BEFORE* ***ERIEZ*** HUMPS WERE IN....*12* PER YEAR! *AFTER INSTALLATION.....* NO FIRES...NO PRODUCTION DELAYS!

RETURN THIS COUPON.

ERIEZ MANUFACTURING COMPANY
1501 EAST 12TH STREET, ERIE, PA.

MY CONTAMINATION OR SEPARATION PROBLEM IS:

_____

_____

PLEASE SEND LITERATURE ☐
HAVE REPRESENTATIVE CALL ☐ PROMPTLY ☐ WHEN IN AREA

NAME _____
TITLE _____
COMPANY NAME _____
STREET _____
CITY _____ ZONE ____ STATE _____

51C

It isn't always the *big* things that throw a profit and loss statement out of line. Many times, a lot of little things can make a big difference. ... Take lubrication, for example. Each machine in your mill has its own requirements. By using the *precisely correct* lubricant in each instance, you reduce "downtime" by lengthening the periods between overhauls. More than that, you effect production economies by reducing power consumption, machinery wear and maintenance costs. Increased production is attained because machinery operates faster and longer. ... Backed by a company which has served the textile industry of the South for more than sixty years, and fortified with long training and experience, your Standard Oil representative is highly qualified to "blue-print" your lubrication needs. Why not call him in today?

down with "downtime"!

STANDARD OIL COMPANY (KENTUCKY)

Gets Your Goods to Market Before Prices Change...

Be wise and thrifty. Write today for full details of this low-cost, highly efficient new enzyme desizing agent . . . RHOZYME LA.

CHEMICALS FOR INDUSTRY

ROHM & HAAS COMPANY

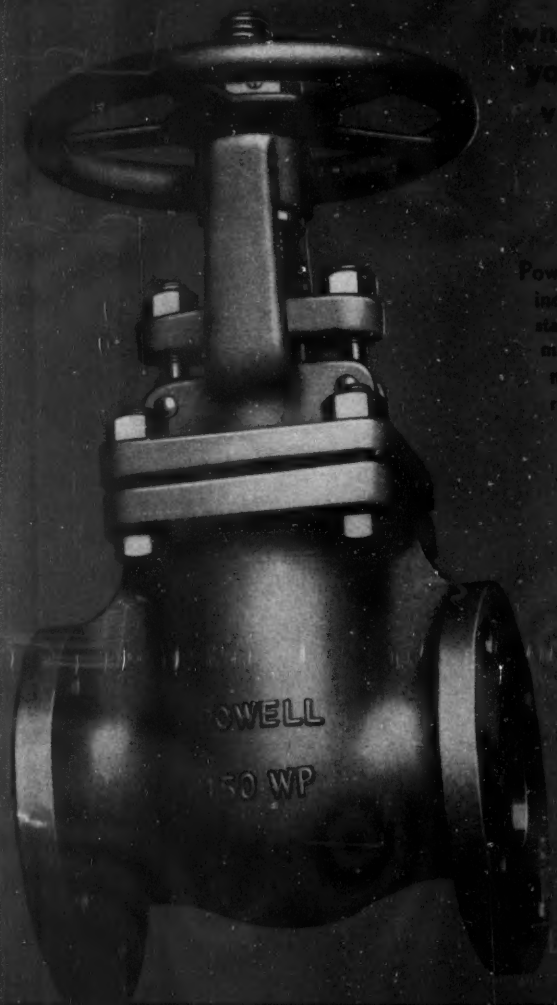
WASHINGTON SQUARE, PHILADELPHIA 5, PA.

Representatives in principal foreign countries

RHOZYME is a trade-mark, Reg. U.S. Pat. Off. and in principal foreign countries.

Why look further?

when Powell can supply you with every kind of valve you may need!



Powell Valves for the Textile Industries include not only a complete line of standard valves of all types but also many designs in corrosion-resisting metals and alloys to meet all the requirements of the modern mill.

Quality fine throughout "The Line"

New 150-pound O. S. & Y. Gate Valve. Available in a wide selection of corrosion-resisting alloys. Made with either flanged or screwed ends. Sizes ¼" to 2". Std. All dimensions of flanged end valves conform to MMS Standard SP-42 and ASA B16.

POWELL

The WM. POWELL CO., 2525 Spring Grove Ave., P. O. Box 106, Station B, Cincinnati 22, Ohio

Some of the numerous variations obtainable on the S&W Modern Komet, including: (1) the new double-welt cuff for pattern interest; (2) the smooth, flat joining of rib top and body fabric—unequaled by any other machine.

ANKLETS AND CREW SOCKS

in One Automatic operation

WITH THE

S&W MODERN KOMET MACHINE

You'll make superior ribbed anklets and crew socks—faster and at less cost—for the children's and ladies' markets, with the S&W Modern Komet Machine. It produces a variety of true-rib hose in all gauges and proportioned sizes. It is the most versatile, fully automatic machine available for either ribbed-to-toe or ribbed top and plain foot types *without costly hand-transferring* and consequent dropped stitches. Furthermore, it achieves a smoother, flatter joining of rib top and plain body fabric than is possible with any other method, regardless of cost.

The two-feed S&W Modern Komet knits anklet tops and legs twice as fast—two courses with each cylinder revolution. It also features a new labor-saving draw thread device that simplifies hose separation and speeds production.

Consult your S&W representative for samples and details.

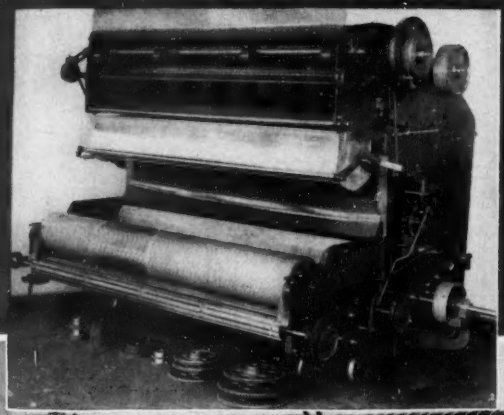
S·W **SCOTT & WILLIAMS, INC.**

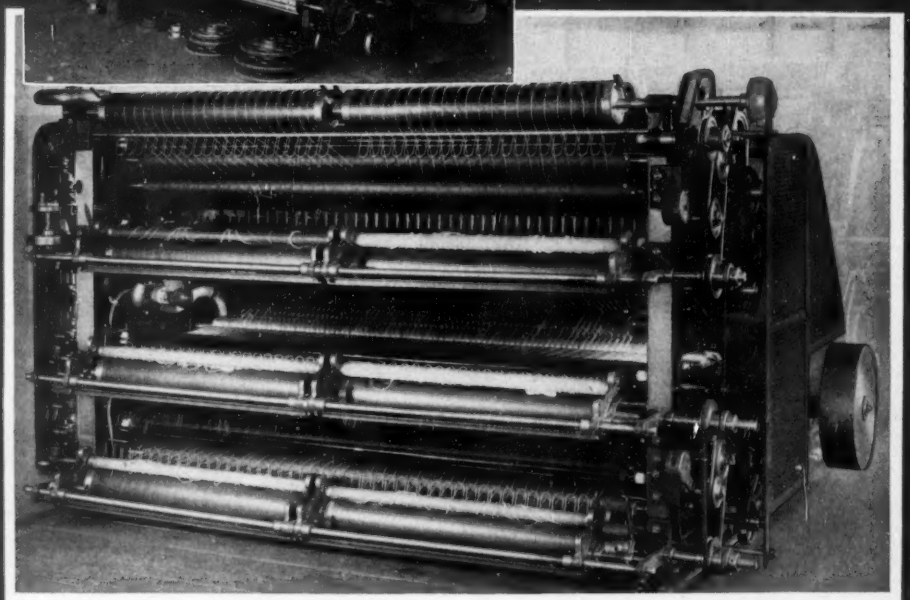
Established 1865

Sales Office: Empire State Building, New York 1, N. Y.
Divisional Offices: High Point, N. C., Reading, Pa., Chattanooga, Tenn.
MAIN OFFICE AND PLANTS: LACONIA, NEW HAMPSHIRE

Duesberg-Bosson

WOOL PREPARING MACHINERY





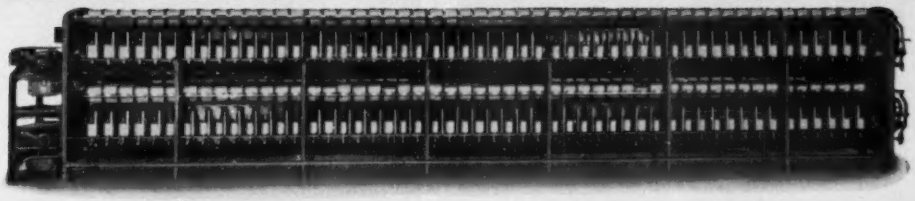
We make WOOLEN CARDS with two, three and four cylinders, for Fine, Medium and Carpet Wools• Patented PERALTA Machine•OILING DEVICE • MIXING PICKER (Fearnaught Type) • PICKER FEEDERS • AUTOMATIC CARD FEEDERS • TAPE CONDENSERS • INTERMEDIATE CENTER DRAW BROAD BAND FEED. Catalogs available.

Duesberg-Bosson of America, Inc.

FITCHBURG, MASSACHUSETTS

"UNIT-CONTROL"

. . . an Exclusive Advantage of the



Fletcher HEAVY-DUTY TWISTER

Many thoroughly proven principles of engineering and design have been built into this Fletcher Twister which is especially adapted to heavy packages. Outstanding is the "Unit Control" feature, a compact, self-contained unit which controls both twist and traverse from one end, with a smooth steady motion. Among the many obvious advantages which "Unit Control" provides are . . . Direct driven traverse . . . no teetering or lost motion . . . compactness, cleanliness, accessibility, interchangeability and greater convenience.

Other features include:

- Oilwell spindles, a year's supply of clean oil. (Anti-friction spindles optional).
- Oilless bearings at every advisable point.
- Easy adjustment of spindle swings, facilitates proper belt contact . . . uniform spindle speeds.
- Individual spindle swing supports, mounted on solid steel rails.
- Each deck an independent unit, driven by individual motor.
- Motors mounted on sliding base.
- Light, pressed steel take-up rolls driven by spindle belt through "Unit Control."
- Collapsible guide eye, for easy removal of large traverse bobbins.
- Power-saving large idler pulleys for high spindle speed.
- Twist gears easily accessible, arranged so number of teeth in gear equals number of turns per inch in yarn.

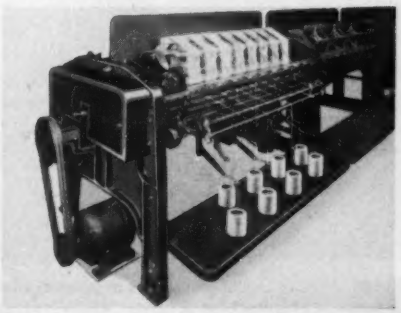
Get all the facts and features of the Fletcher Heavy-Duty Twister—write for Bulletin 65.

FLETCHER "PERFEX" HIGH SPEED REEL

...the Reel with the "Backbone" that Resists Vibration

A ten inch steel I beam throughout the length of the reel provides extreme rigidity in the "Perfex," the reel recognized throughout the world as standard for rayon and nylon yarns. It produces uniformly perfect diamonds, with length of skeins predetermined by either electrical or mechanical means. Shafts and movable parts are guarded for safety. No metal to metal gear meshing assures quieter operation.

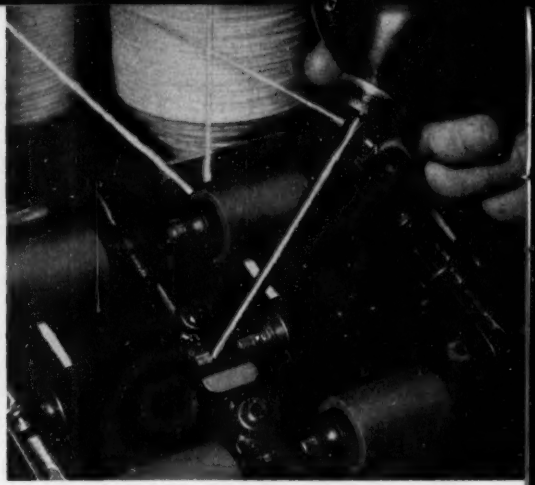
Write for Bulletin 63 that tells all the construction features, dimensions, etc.



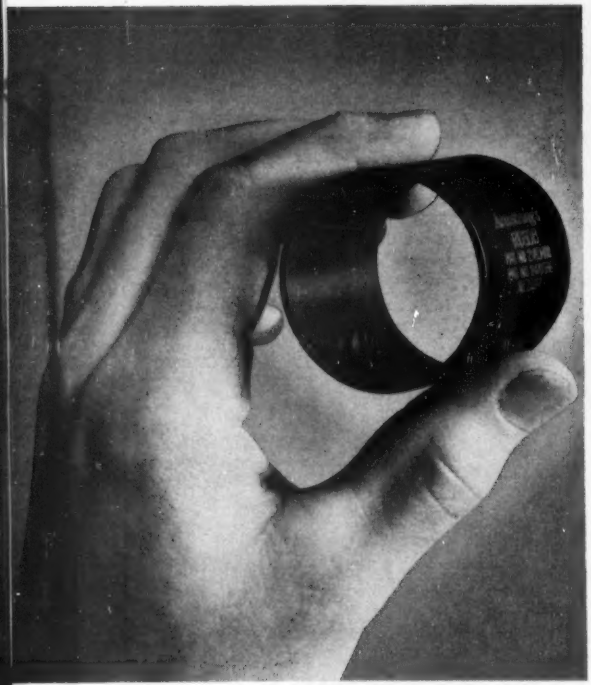
FLETCHER WORKS

2225 GLENWOOD AVE. PHILADELPHIA 40, PA. ESTABLISHED 1850

SATIN FINISH. Accotex Aprons are ground to the exact thickness you specify and finished to satin smoothness by a special process developed and patented by the Armstrong Cork Co. Accotex Aprons never roughen in service.



UNAFFECTED BY OIL, TEMPERATURE, OR HUMIDITY. Oils, dyes, and solvents have no effect on Armstrong's Accotex Aprons. They operate efficiently at any mill temperature, and they won't sweat.

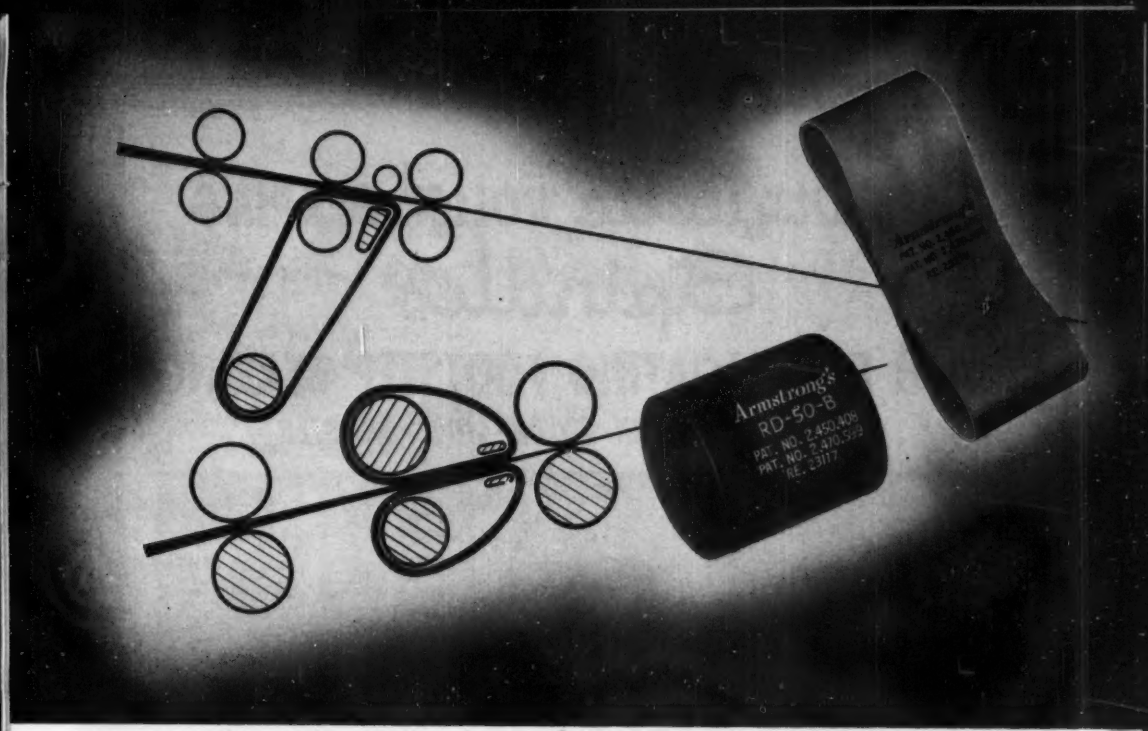


SEAMLESS. Smooth continuous layers of Accotex rubber on both inside and outside of Accotex Aprons prevent irregular slip-roll action. These tough wearing surfaces will not crack or break even after six or more years of service.

SUPERIOR FLEXIBILITY. Armstrong's NO-750 Apron is made to have the extra flexibility and wear resistance needed on single-apron frames. They hug the nose bar closely to insure the necessary smooth slip-roll action.

ARMSTRONG'S ACCOTEX APRONS

one of Armstrong's complete line of textile mill supplies



Single or double apron equipment requires fewer apron replacements when it is equipped with Armstrong's Accotex Aprons.

How to LOWER APRON COSTS on your long-draft frames

You can expect six years or more of continuous spinning from Armstrong's patented Accotex Aprons

Many mills have found that the long life of Armstrong's Accotex® Aprons can substantially reduce apron costs. On their Casablanca frames they use NO-700 Accotex Aprons, and on their single-apron frames they use Armstrong's extra-flexible NO-750 Accotex Aprons.

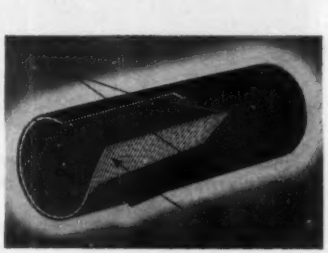
Experience varies slightly from mill to mill, but these aprons can be expected to give up to six years and more of efficient service. One Georgia mill, for example, used the same set of NO-700 Accotex Aprons continuously for eight years. Service like that means a big saving in apron replacement expense.

The secret of this long life is the carefully engineered construction of Accotex Aprons. As shown in the diagram below, the Accotex Apron is made in three special-purpose layers. The seamless inner layer is a synthetic rubber that can withstand abrasion—ten million trips over the nose bar, for instance, during six years of normal two-shift operation on 16's.

The outer layer of an Accotex Apron is also seamless synthetic rubber . . . treated by a patented process that enables it to withstand years of service without cracking or developing rough spots.

Between these seamless rubber sleeves is a sturdy cord interliner that absolutely prevents stretching or curled edges. Vulcanized together, these three layers have all the qualities needed for an efficient, economical long-draft apron.

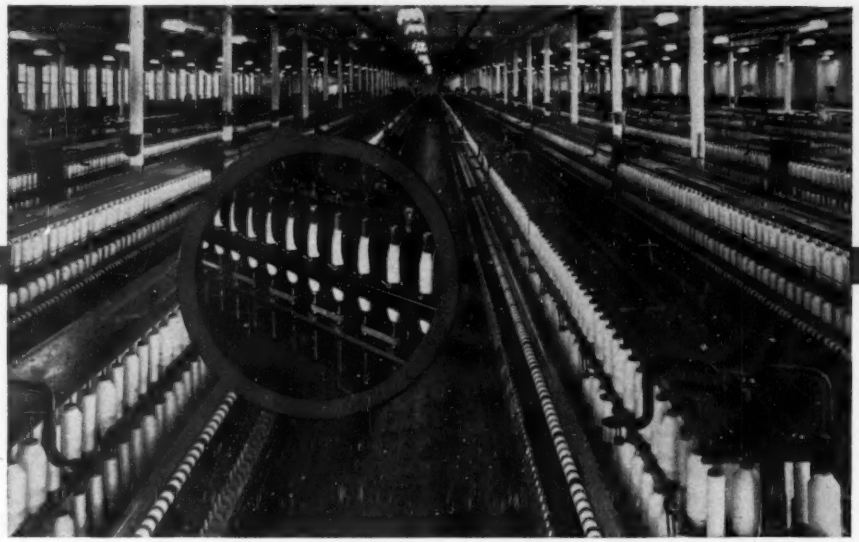
No matter what type of long-draft equipment you use in your mill, you can get Accotex Aprons that will help you cut your apron replacement expense. Call your Armstrong representative for samples or write to the Armstrong Cork Co., Textile Products Department, 3603 Arch Street, Lancaster, Pa. Armstrong's textile products are available for export.



Marquette ROLLER BEARING Spindles

WITH FULL-FLOATING FOOTSTEP BEARING

FOR COTTON • RAYON • NYLON • WOOL • WORSTED



Starting with a test frame in 1946, the mill pictured above has 33,700 Marquette Roller Bearing Spindles in operation today.

In this mill—as in many others—Marquette Roller Bearing Spindles have established new high standards of performance. They produce yarn of highest quality. They save power, save tapes, save lubricant, and require less maintenance. They operate efficiently at high speeds with large packages. Result: MORE YARN AT LOWER COST.

Let us prove this through a test installation. Contact our home office or one of our representatives.

The Marquette METAL PRODUCTS CO.

PROTECTED BY U.S. AND FOREIGN PATENTS, AND PATENTS PENDING

CLEVELAND 10, OHIO

Representatives:

Also Manufacturers of: HYDRAULIC GOVERNORS • FUEL OIL PUMPS • FUEL OIL INJECTORS WINDSHIELD WIPERS FOR AIRCRAFT, TRUCKS AND BUSSES • PRECISION PARTS AND ASSEMBLIES

Textile Industries
Vol. 115 • March, 1951

Make Your Training Job Easier

THE EXTRA-LENGTH feature article, "Physical Textile Testing," in this issue, is a manual which should be of interest to anyone connected with the textile industry who must either test his own product and processing work, or who must have the testing done by ouside concerns and use the results.

Although the manual was prepared primarily for the training of laboratory technicians at the West Point Manufacturing Company, it has been found useful by assistant overseers, technologists, top production men, executives of the company, men who sell the company's products, and the customers of the company.

It describes in a straight-forward manner and in simple terms the physical tests which are made on textile products, and as such it provides a type of reference material long needed by the industry.

At West Point the testing department is a component of the Research Division. As an entity it tests both stock in process and finished goods in an unbiased manner, serving alike the manufacturing, executive, and sales divisions.

The testing department seeks only one fact—the truth. Accuracy is essential in getting the truth. And accuracy is the goal of the laboratory personnel.

The testing department personnel are also trained to notice inordinate findings. When this is done and the facts are reported, executive authority is in a position to make decisions competently.

The testing manual aids the laboratory in its search for the truth, by standardizing testing methods. In turn, the manual permits the manufacturing divisions, the sales agents, and the customers of the company to understand how the products are tested.

Preparation of the manual is another forward step by this progressive organization; it will prove beneficial in the times ahead.

AS THE INDUSTRY goes further into defense production and as valuable technicians and key men are called into the armed services, quicker training of textile replacements will be essential. On-the-job training and practical experience in textile work are necessary for the performance of duties, but training can be speeded and standardized if written instructions are prepared for newcomers as supplementary aids.

The principle of using a Standard Operating Procedure or manual has enabled the armed services to train men quicker. This principle could well be borrowed by other units of the textile industry for training operatives and men who must step into key positions.

If your supervisors and technicians have not prepared a working manual concerning their own jobs and the jobs of those under their supervision, let them try it.

You will make your training job easier.—JCF

WOULD YOU PLAY A TOURNAMENT *with one club?*

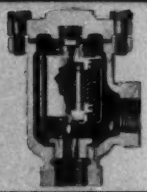
But on the golf course you can see the results. In steam hook-ups on the other hand, bad performance may go undetected for years, even though the traps apparently are working properly.

If you are in competition, it is certain that you cannot get the lowest fuel costs and highest production rates from steam heating and process equipment by "standardizing" on one type of steam trap for all purposes in your plant.

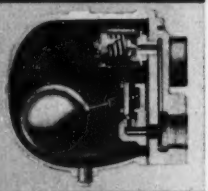
The four principal types of Sarco steam traps are illustrated at the right. They are available in a wide range of sizes and steam pressures and each has a specific function. The trick is to get the right trap on every steam job and every steam line in your plant. This can be done by calling in the Sarco Representative near you, or by asking for Sarco Catalog No. 1600 which gives recommendations for trapping all kinds of equipment, both indoors and out.

STEAM TRAPS ARE LIKE THAT...

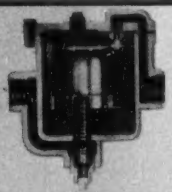
Thermostatic Trap



Float-Thermostatic Trap



Bucket Trap



Liquid Expansion Trap

312

SARCO SAVES STEAM

SARCO COMPANY, INC.

Represented in Principal Cities

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SARCO CANADA, LTD., TORONTO 5, ONTARIO

IMPROVES PRODUCT QUALITY AND OUTPUT

News IN BRIEF

French Propose International Standards for Textiles. The Union des Industries Textiles, with which the French textile trades are affiliated, has proposals under consideration for international standardization of cotton, woolen, linen, and rayon cloths needed under the North Atlantic Treaty Organization.

R. T. Stevens Gets Government Post. Commerce Secretary Charles Sawyer has appointed Robert T. Stevens, chairman of the board of J. P. Stevens & Co., Inc., as head of the Business Advisory Council of the Commerce Department.

New Textile Division Head for NPA. Henry A. Thurston has been named acting director of a new Textile Division in the National Production Authority. NPA split its Textile and Leather Division, thereby creating the Textile Division of the NPA. Both divisions are to remain temporarily in the "T" Building, Washington, D. C.

Wool Stockpile Proposed for 1952. The Interdepartmental Committee of the Munitions Board has proposed a reserve of 350 million pounds of wool, clean basis, to be stockpiled beginning next year. Although wool has been added to the list of materials to be stocked for defense, the amount to be stockpiled has not been definitely determined.

Underwear Mills to Observe Price Freeze. Roy Cheney, president of the Underwear Institute, has asserted that underwear manufacturers will make every effort to observe rules and regulations of the price freeze. Mr. Cheney pointed out that further restrictions on copper and brass for gripper-type fasteners would create a serious problem for manufacturers of many types of underwear because there are not enough button sewing machines to compensate for the loss of grippers.

Textile Printers Not Affected by Copper Ban. Nothing affecting textile printers and engravers has been found in a National Production Authority ban on the use of copper. A previous order curtailing copper usage 15 per cent in January and February and another 20 per cent cut in March does not seriously affect engravers and printers. The supply of available copper is expected to be reduced and prices may increase.

CRAFTS CENTER AT STURBRIDGE, MASS.

Weavers at Old Sturbridge Village Museum and Crafts Center demonstrate the ancient craft on old looms to visitors. The weave shop is one of the many functional craft shops that currently comprise the 30-building arrangement of this recreated 18th century New England rural community.

Prices Set for Sulzer Weave Machines. Warner & Swasey Co., has revealed that the Sulzer weaving machine has been priced at $7,910 for the 80-inch model, and $8,600 for the 110-inch model. The prices do not include the cost of heddle frames, harnesses, motors, and extra equipment. The present back-log of orders extends into next year, and future production schedules are uncertain because of the firm's position in the defense structure.

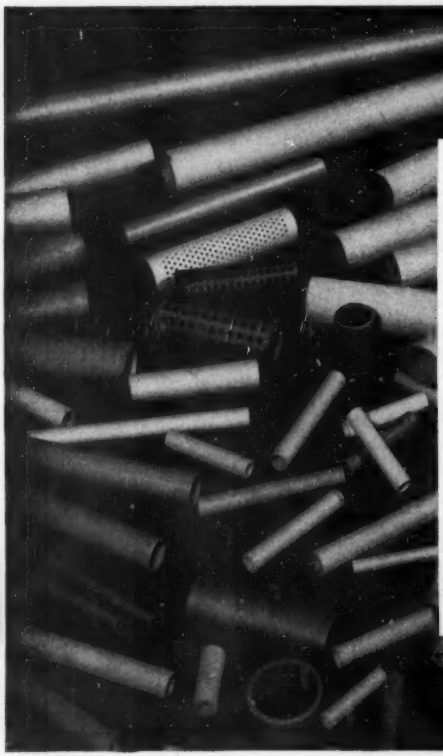
Development of Ramie and Kenaf. Legislation, which would set up a 50 million dollar fund to launch a 10-year program to encourage domestic production of ramie and Kenaf, has been brought before the House Armed Services Committee.

Dynel Bed Blanket by Pepperell. A new full-size dynel bed blanket is to be offered on the market in March, following closely the marketing of Pepperell's dynel baby blanket which has received enthusiastic reception. Pepperell emphasizes that the new blanket is in no way to be considered a substitute for existing fibers, but it is an outstanding new development.

Handicapped Obtain More Jobs. Marked progress has been made by industry in providing gainful employment for the physically handicapped, according to the Bureau of Employment Security. Handi-

SONOCO TEXTILE TUBES

SERVING THE TEXTILE INDUSTRY SINCE 1899



SONOCO manufactures a complete line of textile paper tubes . . . in any practical length and wall thickness . . . with inside diameters from ¼" to 24".

With each order made to individual specifications . . . SONOCO spiral and parallel wound tubes can be impregnated, treated, printed, notched, scored or perforated.

Our technical service department is maintained for your benefit. We welcome the opportunity to consult with you on any of your winding, twisting or carrier problems.

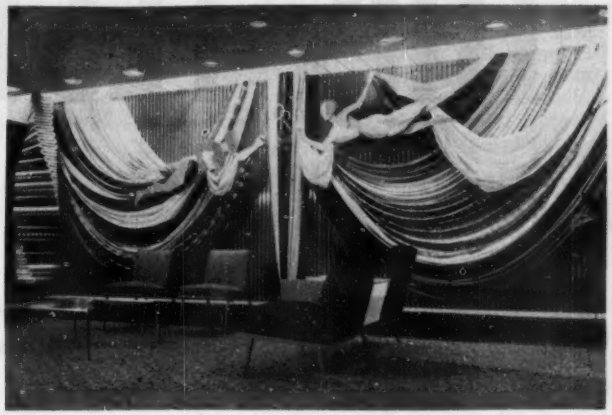
Knitting Arts Exhibition
Atlantic City, N. J.
April 30-May 4, 1951
Booth No. 373-374

SONOCO PRODUCTS COMPANY

BRANTFORD ONT. | HARTSVILLE S. C. | MYSTIC CONN.

DEPENDABLE SOURCE OF SUPPLY

sonoco
REGISTERED TRADE MARK
PAPER CARRIERS
REG. U.S. PAT. OFF.



NEW OFFICES FOR DAN RIVER MILLS

A partial view of the reception room in the new offices of Dan River Mills, Inc., at 1407 Broadway in New York City. The display of fabrics at one end of the room is twenty-four feet long and eight feet high. On the left side are shown representative men's wear patterns and on the right, women's dress goods.

capped individuals numbered 32,544 in new jobs during October as compared with 21,171 in the same month of 1949.

Materials Handling Conference Includes Textiles. Problems of materials handling in the textile industry will be considered at the Materials Handling Conference which will be held concurrently with the National Materials Handling Exposition at the International Amphitheater, Chicago, April 30-May 4.

No restraints for Textile Hoarding. Although some textile materials are in short supply, there is little danger of hoarding; therefore the National Production Authority directive does not control textiles generally. The inventory control directive does apply to nylon, high-tenacity rayon yarn, burlap, and cotton pulp.

QM Needs No Textile Specialists. The Office of Quartermaster General has revealed that no program has been initiated to secure trained textile or garment men for Quartermaster positions.

Waste Dealers Form Processors Group. The National Association of Waste Material Dealers, Inc., has formed a new division designated The Textile Fibers Processors Institute. The new organization is open to garnetters of all textiles, and a convention is scheduled to be held in Chicago in March.

Hosiery Mills Abandon Throwing. Formerly, about 60 large manufacturers of women's hosiery operated throwing departments. The advent and development of nylon has led to the abandonment of such operations in most hosiery mills. Today there are only 15 hosiery mills which still do their own throwing, and most of these are in the South and the Middlewest.

Army to Buy Seconds in Heavy Underwear. Because of the unusual design and construction of the pajama type heavy underwear for the armed services, there is no civilian market for seconds or irregulars of these garments; therefore the Army has agreed to purchase irregulars at a 10 per cent reduction from the contract unit price.

NPA Directive for Carded Yarns. Directive M-23, issued by the National Production Authority, is an effort to make equitable distribution of DO orders among producers of carded cotton sales yarns. The volume of orders each plant must accept is limited to 10 per cent. Percentage volume is to be based on average monthly shipments of the spinner for the first eight months of 1950. The order must reach the manufacturer at least 15 days before the first day of the month in which shipment is requested.

Mill Pays Half Instruction Cost. Any employee at Joanna Cotton Mills, Joanna, S. C., who wishes to further his knowledge of textiles can get his or her instruction at half price. The mill reimburses the employee for half the cost of any International Correspondence School textile course which is successfully completed.

Raw Silk Deliveries Set New High. Deliveries of raw silk for consumption in the United States amounted to approximately 64,008 bales of 133 pounds in 1950. Including re-exports, the total amounted to 67,214 bales. The figures represent a new post-war high, according to the American Silk Council, Inc.

Old Slater Mill to be Rejuvenated. A "treasure hunt" has been launched in Pawtucket, R. I., to find old textile machinery for the Slater mill, birthplace of the cotton textile industry in America. The Old Slater Mill Association wants to put the mill in working order. The objective is to duplicate

MAKE THIS TEST

...and save money while you're making it

Install new or rebuilt Jenkins card screens on any card in your mill. Then, by regular inspections, compare the fly waste under your Jenkins screen with the waste under ordinary screens.

Count your results in Dollars Saved

Mill men who have actually made this test found that in only one year's time they had saved enough good cotton to pay for every Jenkins screen used in the test, and the screens were still practically good as new!

See for yourself the extra years of trouble-free service you get from Jenkins card screens . . . engineered to set closely to your cylinder in every dimension, constructed with Jenkins patented efficiency features to completely eliminate excessive card fly, backed by 38 years of research and experience, fully guaranteed.

Can you afford *not* to make this money-saving test? See your Jenkins representative for complete information.

JENKINS

ENGINEERED PRODUCTS

JENKINS METAL SHOPS
GASTONIA, N. C.

as closely as possible the production system in use in the days of Samuel Slater, the founder. George West of Whitin Machine Works, is chairman of the "treasure hunt" committee.

Voluntary Protection of Technical Information. The Office of Technical Services of the United States Department of Commerce will receive requests for advice as to whether specific technical data should be disclosed, withheld, or given limited distribution. OTS will obtain expert opinions from the interested departments and agencies of the government and inform the inquirer accordingly.

Engineering Experience Offered to Professors. Granville M. Read, chief engineer of E. I. du Pont de Nemours and Co., has stated that professors in engineering schools should spend a year in industry, and he made a concrete offer to provide places for some of them. Mr. Read proposed "giving them twelve months experience throughout our entire engineering organization. We will pay them their regular salaries plus reasonable expenses."

Industrial Idleness. Work stoppages increased to approximately 4,700 in 1950, as compared to 3,606 in 1949, according to the Bureau of Labor Statistics. 38,500,000 man-days were lost through strike idleness; however this figure and the number of employees involved were substantially less than in 1949.

Army Cold-Weather Clothing. New army troop wear is now approved for future issue. Included in the new ensemble is a double-faced frieze liner for the field jacket, a loose-cut wool shirt with square tails for tucking or wearing out, and pajama-type underwear of much looser design than present winterwear. A new wool field shirt will replace present flannel shirt, and rayon lining will be used in the jacket liner.

"Consumer Clinic" Urges Informative Labels. The development, and use in labeling, of standards for consumer goods would serve as specific guides at the counter to enable the purchaser to know what is offered for the price asked, according to speakers representing the public at a "Consumer Clinic" on standards. The "Clinic," held in New York City, was sponsored by the American Standards Association. Speakers at the conference urged manufacturers to adopt a policy of more informative labeling of all products.

Experimental Wool Scouring Machine. Lowell Textile Institute, Lowell, Mass., has developed an experimental wool scouring machine. The machine was designed to deal with the necessity of by-product recovery and waste treatment, in addition to performing the usual functions in scouring wool.

Research Internships Available. Four research internships for graduate students and college faculty members will be available at the Southern Regional Research Laboratory during 1951 under cooperative program of the U. S. Department of Agriculture educational institutions, and the U. S. Civil Service Commission. Interns will be employed in a number of other agencies of the USDA. A total of 58 appointments has been approved.

News in Brief

Carpet Production. The carpet industry produced approximately 86 million square yards of carpets and rugs in 1950, according to an announcement by the Carpet Institute. This was an increase of 13 million square yards over 1949.

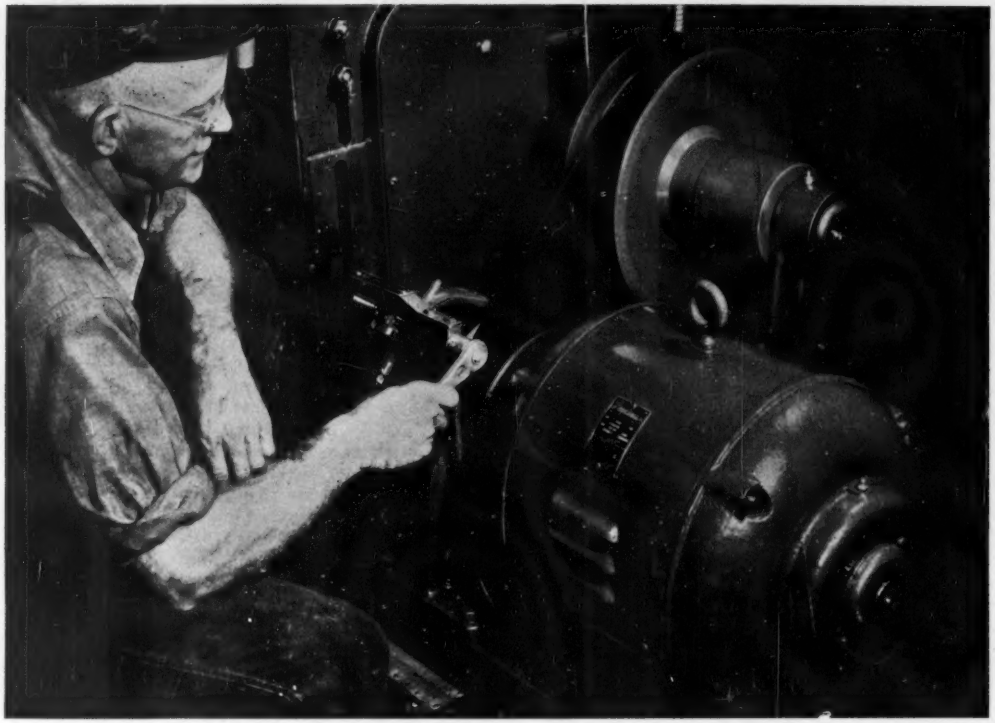
Silk & Rayon Print Institute. A non-profit organization to further industrial, trade, and consumer relations of the silk and rayon print industry, will also conduct research experiments. The 66-member group, called the Silk & Rayon Print Institute, has elected Clyde E. Murray as president. Members are firms in silk and rayon converting and printing trades. Headquarters: 270 Park Ave., New York.

Finishers Plan for Emergency Concentrated national emergency efforts are being planned by the

RIPPELASTIC, ELASTICIZED COTTON BY BATES

Bates Rippelastic, the first elasticized fabric to be sold by the yard for home sewing, cuts easily without popping, and even a beginner can do an expert fitting job without painstaking care. Its rich texture is creating new uses for cotton for home sewing, and its soft easy feel next to the skin is one indication that its popularity will continue, according to Bates Fabrics, Inc. Pictured here is one of the two patterns developed by the McCall Corporation especially for Rippelastic. The elasticized fabric washes well, never needs ironing, and its elasticity lasts the life of the fabric, the manufacturer stated in the announcement.

REEVES Vari-Spin Drive . . .
by far the quickest way to change cylinder speeds



To change speeds, simply turn a screw

- **Eliminates downtime and troublesome pulley changes.**
- **Speed changed without stopping the machine.**
- **Speed changes *always* immediate and positive.**
- **Full lubrication assures free-moving parts.**
- **Speed setting is accurately maintained.**
- **Compact—nests into narrow aisles.**
- **Uses any standard constant speed motor and only one belt.**

Mills report outstanding results with this new simplified drive . . . the minimum of ends down at the highest possible production rate!

Speed adjustment with the REEVES drive is stepless and infinite within its range—2½:1. This wide range covers operating speeds for all yarn sets. Slightest speed changes can also be made to compensate for excessive tension and for humidity or temperature variations.

The REEVES drive is so positive that returns to previous cylinder speeds within a fraction of an rpm are secured. The design is so simple that installation and maintenance are quick and easy. Get complete information. Write today for Vari-Spin Bulletin T61A-501.

accurate · variable
REEVES *Speed Control*

REEVES PULLEY COMPANY • COLUMBUS, INDIANA
Recognized Leader in the Specialized Field of Speed Control Engineering

National Association of Finishers of Textile Fabrics. Finishers are better prepared than during World War II to do their part, according to Arthur G. Poor, who was re-elected association president at the 37th annual meeting of the association at Hotel Statler, New York City.

Parts Manufacturers Get Priorities. Textile and sewing machinery manufacturers will be authorized to use priority ratings to obtain metal to make maintenance, repair, and operating parts (MRO), under a system on which the National Production Authority is working.

Knitting Mills Foresee Labor Shortage. The available supply of manpower will be a growing problem to the knitted outerwear industry in 1951, according to Sidney S. Korzenik, executive director of the National Knitted Outerwear Association. Fewer operatives are available than in 1941 to produce materials for the defense program, and there are no labor reserves from which to draw, he asserted.

Rayon Production Capacity. The capacity of the rayon producing industry in the United States in mid-November 1950, totaled 1,306,000 pounds on an annual basis, according to the Textile Economics Bureau, Inc. Capacity of American producers has increased approximately 9 per cent since the end of 1949.

QM Urges Vat Dye on Wool. Officials of QMC are emphasizing the importance of vat dyeing for the large quantities of serge and shirting now being ordered and the large amounts to come.

Cannon to Head Textile Mills Information Group. C. A. Cannon, president of Cannon Mills Co., Kannapolis, N. C., is to act as chairman of the Textile Mills Information Committee. Mr. Cannon succeeds the late G. Ellsworth Huggins.

Textile Degrees Awarded at Clemson. The Clemson College School of Textiles awarded degrees to 72 seniors at midterm commencement exercises on January 28 in the college auditorium.

Washington Office for Underwear Institute. An office is to be established in Washington for the Underwear Institute, according to an announcement by Roy Cheney, president of the Institute. The new office will be provided to cope with legislative problems arising during the current emergency.

News in Brief

Textile Education — Technologists or Technicians. Educators in the textile field are questioning the sagacity of the current trend toward more and more degree granting textile schools. There is crying need for both vocationally trained textile technicians and textile technology degree holders. However, educational facilities for the short diploma granting courses are disproportionately small compared to college level textile schools.

Quality Control Meet. On Friday, April 13, 1951, at the School of Textiles, N. C. State College, Raleigh, N. C., a quality control meeting is planned for interested persons in the Carolinas, Virginia, and other states. This will be the second meeting of this Quality Control Group which first met at Gastonia, N. C., last fall (see pages 90-93, TI for Nov., 1950). Program includes discussion of neps and cotton, developments in opening equipment, plant management with statistical quality control, effect of card licker-in speed on quality, and the Shirley Analyzer. Details may be obtained from Clyde E. Moss, Firestone Textiles, Gastonia, N. C.

LABOR RULINGS OF INTEREST TO TEXTILE MANUFACTURERS

Statement of union agent that employees who failed to join union "would eventually lose their jobs" constitutes coercion of employees by union.

Walsh-Healey Public Contracts Act applies (1) to government contract in excess of $10,000 regardless of whether goods contracted for are in existence at time of award or must be manufactured, and (2) to contracts contemplating purchases of goods in excess of $10,000, although shipments under the act fall short of that amount.

Discharge based on poor attendance for illness over extended period is upheld by arbitrator, since employer "should be under no obligation to retain an employee who is so habitually ill or suffering from injury as to make his services of little value to the company."

Union fines for non-attendance at meetings are not "periodic dues" within the meaning of LMRA, and union's demand for discharge of employee for failure to pay fines and employer's compliance constituted unfair labor practice by both.

Senior qualified bidders are entitled to vacancies and employer may not assign "trainees" to them in order to give job training. Arbitrator holds that if the trainees filled the jobs, employees would be prevented from gaining promotion on the basis of seniority and ability.

Discharge for gross carelessness in performance of job is upheld based on work record that employee previously had received reprimands for "carelessness and incompetent workmanship."

RELIANCE V★S DRIVE ®

"Drive by RELIANCE" means

PEAK PRODUCTION at LOWEST COST on any textile range!

There are good reasons why so many modern textile range drives are engineered by Reliance! Take the advantages inherent in the Reliance V★S Drive, add the Reliance know-how of over 30 years of specialization in planning range drives, and the result is always *peak production at lowest cost.*

Operating from A-c. circuits, the *All-electric* Reliance V★S Drive, offering quick, smooth starting and stopping and regulation of speed and tension can be adapted to any requirements. Consult a Reliance Application Engineer *early* in your consideration of new equipment or your modernization of existing equipment! Write for Bulletins 311 and D-2101.

Sales Representatives in Principal Cities

RELIANCE ELECTRIC AND ENGINEERING CO.

"Motor-Drive is More Than Power" • 1085 Ivanhoe Road, Cleveland 10, Ohio

AN EXECUTIVE Views THE NEWS IN TEXTILES

Prepared by a man who is closely identified with the textile industry.

Improved Public Relations

THE WRITER of this column moves around over the country quite a bit, and since most of this traveling is done in the textile areas he probably encounters a higher percentage of textile people than would the average traveling salesman. This is especially true because your reporter's interests lie with textiles, and about the only full-time jobs he has ever had have been in this industry.

In these travels we have heard countless textile men talk about the need for public relations and the great value of having the newspapers on the side of the industry. There seems to be an appreciation of the fact that we shall receive better treatment in Washington and in the capitals of all of the textile states if we have public opinion on our side. The formation of the Textile Industry Committee on Public Relations several years ago accentuated and pointed out this new emphasis.

At the same time, however, as we make these travels to and fro across the New England states and the southern states, we also encounter quite a few newspapermen whose responsibility is the collection of printable information from the general public. Some of these specialize in industrial news, and others are reporters for small town newspapers; thus they are responsible for stories involving local corn huskings, the shower tended the banker's daughter, and the burning of Farmer Brown's barn. They all have one thing in common, however, and this is that their jobs depend upon their ability and skill in the gathering of news items and in the writing of these items for public consumption.

Another Viewpoint

The startling thing about all this, and actually the "meat" of this little article, is that the textile people have such an entirely different conception of the meaning of public relations from the idea of the newspapermen. There are still quite a few textile executives who think of public relations as being divided into two categories: (1) Trying to keep all unfavorable news out of the paper; (2) "Bawling out" the editor of the paper—or the reporter—when unfavorable news does appear.

Newspapermen, on the other hand, take the viewpoint that the press has a public duty to perform and that it must report the news objectively without fear and without bias.

It is not always a simple matter to reconcile these two viewpoints.

In defense of the working press, it should be pointed out that one of the things which has distinguished this nation from nearly all other nations of the world is the fact that its citizens enjoy certain freedoms. We do not mean the New Deal's various freedoms because, as we have pointed out on other occasions, few men obtain freedom from want, fear, etc. without many years of hard work. We do mean, however, that the American people have for several hundred years enjoyed freedom of religion, freedom of assembly, freedom of speech, and freedom of the press.

Most of the newspapermen we know are highly resentful of any indication that attempts are being made to infringe upon these freedoms, and especially upon the last one named. Their job, they contend, is to look at the world's bravery and cowardice, its comedies and its tragedies, and to report what they have seen.

One Specific Complaint

Practically all old-time newspapermen agree that things have changed for the better in the textile industry. Time was when it was about as much as a reporter's life was worth to ask a mill execu-

Proposes Modification of Uniform Fabrics

"The cloths demanded by the services today are all top luxury fabrics—parade ground cloths," wrote one woolen mill executive recently. ". . . the expense to create them is placing a real cost on the government."

He proposed modification of some cloths, especially outerwear.

"It is not right," he said, "that these service agencies pass off the requests (for modification) by the stock answer 'nothing is too good for the boys.' By modification nothing will be taken away from comfort or wear. We do not suggest cloths as low in grade as those used by other world organizations either."

IMPROVED

Emery Twitchell Oils For SANFORIZED FABRICS

Now...Emery Twitchell Oils 7240 and 7250 Give You 4 Extra Advantages

1. **IMPROVED COLOR and ODOR STABILITY...** will not yellow or stain fabrics. Cannot turn rancid on fabrics during storage.
2. **GREATER HEAT STABILITY...** Major improvement in heat stability gives maximum resistance to volatilization and decomposition during processing.
3. **INCREASED RESISTANCE TO SALTING OUT...** compatibility with finishing additives such as salts and other weighting agents is improved considerably.
4. **GREATER REWETTING ABILITY...** Faster rewetting increases fabric throughput . . . gives greater overall production efficiency during compression shrinkage. More uniform rewetting results in uniform shrinkage.

In addition to the major improvements listed above, these new Emery Twitchell Oils provide the following characteristics:

FIBER LUBRICATION—The excellent lubrication characteristics provide for easy and uniform rearrangement of the fibers during the preshrinking of fabrics. Prevent sticking at the shoes, enable increased processing efficiency.

REWETTING—High rewetting speeds for faster processing and uniform rewetting of fabrics. Treated fabrics retain rewetting properties indefinitely.

SOFTNESS—For various fabrics and finishes, Twitchell Oils provide the different degrees of softness required to meet specific needs.

CHOOSE THE TWITCHELL OIL WHICH BEST MEETS YOUR REQUIREMENTS

PRODUCT	FIBER LUBRICATION	REWETTING	SOFTNESS	STAINING
Twitchell 7250	Very Good	Fastest	Softest	None
Twitchell 7240	Excellent	Fast	Moderate	None
Twitchell 7231	Excellent	Medium	Slight	None

For a recommendation to fit your particular need, contact our Sales Service Department.

tive for a story on anything, even the time of day. Now, however, the industry is spending thousands of dollars each year for public relations, and many mills even employ men whose sole responsibility is the handling of public relations for that particular mill.

One specific complaint we continue to hear, is that reporters who go to a mill for information are frequently shunted from one individual to another until they lose all interest in everything except trying to strike back at the system, or lack of system, which has delayed them and practically jeopardized their jobs. These reporters feel that in every mill some individual on a high policy level should be delegated with the responsibility of talking to the the press. Many mills have such individuals, but frequently he is on a level about equal with the office boy, and when asked the most insignificant question must necessarily reply that he "will have to talk to the president" before he can answer.

The average small or middle-sized mill does not need a highly-paid public relations man. It does, however, need an executive who is fair-minded, who understands the problems of newspaper people, and who is vested with the authority to answer questions. In every mill office there are men who have these abilities, and all that is lacking is for the executive at the top of the line to issue the administrative directions which will establish a press contact.

Is this asking too much? Newspapermen have a job to do, and it happens to be writing news. Textile men have a job to do, and it happens to be running textile mills. Certainly we need not take the attitude that "never the twain shall meet." We in the textile industry have made tremendous progress in improving our public relations but there are still many things we can do to obtain a more favorable public reaction. The improvement of our press relations is one of these things.

Job Well Done

No mention of public relations in the textile industry would be complete without a mention of the one individual manufacturer who, in recent years, has probably done more than any other single individual for the promotion of better public relations. We believe it was in 1946 that G. Ellsworth Huggins, president of Martel Mills Corporation, with 4extile plants located in North Carolina and South Carolina, became so aroused over the apathy regarding this subject that he became instrumental in organizing the Textile Industry Committee on Public Relations.

We had many conversations with Mr. Huggins on this subject, and we found him first to admit that he had been as lax in this connection as anyone else. At the same time, he understood that the first requisite for the correction of the situation was the realization that the situation needed correcting. Thus it was that he became a valiant worker for improved understanding of the textile mills.

It was felt that an organization outside the scope of activities of the several trade associations might be considered as more unbiased, and for that reason his Committee was unaffiliated with any other groups. It will be recalled that the Committee operates on subscriptions obtained from individual plants. The spending of the money is controlled by the Committee and the professional work is handled through a public relations agency, Dudley, Anderson & Yutzy, of New York City.

With these thoughts in mind, those who did not know Mr. Huggins personally can readily appreciate the feeling of sorrow which pervaded the textile industry when news came of his death. In recent years, perhaps no textile man has contributed more generously of his time and his energies than has Mr. Huggins. Although well beyond the prime of life, he did not spare himself in performing what he considered his duty toward improving public relations for the textile industry.

Mar. 14-16—Spring meeting, Committee D-13 on Textile Materials, American Society for Testing Materials, New York, N. Y.

Mar. 24—Spring meeting, Textile Operating Executives of Georgia, Harrison Hightower Textile Engineering Building, Georgia Institute of Technology, Atlanta, Ga. Time: 9:30 AM. Subjects: carding and spinning.

Mar. 29-31—2nd annual meeting, American Cotton Manufacturers Institute, Inc., Greenbrier Hotel, White Sulphur Springs, West Virginia.

April 2-5—Spring meeting, American Society of Mechanical Engineers, Atlanta Biltmore Hotel, Atlanta, Ga.

April 12-14—Annual meeting, Alabama Cotton Manufacturers Association, Hotel Buena Vista, Biloxi, Miss.

April 13—2nd meeting of the Quality Control Group, School of Textiles, North Carolina State College, Raleigh, N. C.

April 16-18—6th annual convention, American Society of Lubrication Engineers, Hotel Bellevue-Stratford, Philadelphia, Pa.

April 17-20—20th National Packaging Exposition, Auditorium, Atlantic City, N. J.

April 28-May 5—National Cotton Week.

April 28-May 20—International Textile Exhibition, Parc des Expositions, Lille (Nord), France.

April 30—47th annual meeting, National Association of Hosiery Manufacturers, Claridge Hotel, Atlantic City, N. J.

April 30-May 1—14th Hosiery Industry Conference, Claridge Hotel, Atlantic City, N. J.

April 30-May 4—Knitting Arts Exhibition, Atlantic City (N. J.) Auditorium.

April 30-May 4—National Materials Handling Exposition, International Amphitheater, Chicago, Ill.

April 30-May 11—British Industries Fair, London and Birmingham, England.

May 16-18—Annual convention, Cotton Manufacturers Association of Georgia, Sheraton Plaza Hotel, Daytona Beach, Fla.

June 18-22—Annual meeting, American Society for Testing Materials, Chalfonte-Haddon Hall, Atlantic City, N. J.

June 21-23 — Annual convention, Southern Textile Association, Mayview Manor, Blowing Rock, N. C.

Oct. 4—Sixth annual meeting, Carded Yarn Association, Inc., Carolina Hotel, Pinehurst, N. C.

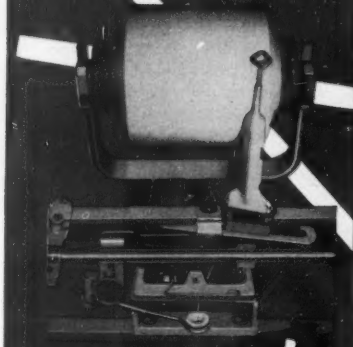
Oct. 17-19—Annual convention, American Association of Textile Chemists and Colorists, Hotel Statler, New York, N. Y.

It's a PRODUCTION FACT

with the high-speed —HEADLESS PACKAGE— U.S. ACME FACE DRIVE —TWISTER—

You can

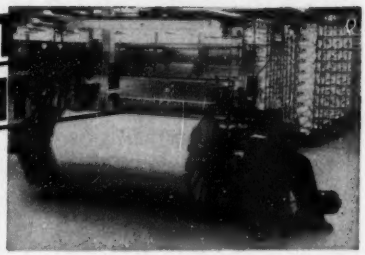
★ INCREASE PRODUCTION!
★ IMPROVE QUALITY!
★ ELIMINATE REDRAWING!
★ PRODUCE 1-lb. to 1½-lb. KNOTLESS PACKAGES!



NO FLYER!

DIRECT to AUTOMATIC QUILLING or HIGH SPEED WARPING

WITHOUT REDRAWING



PRODUCTION HIGHLIGHTS

★ Twist without flyer up to 15,000 R. P. M. with balanced bobbins!
★ Combination yarns, voiles, acetates and nylon up to 35 turns per inch!
★ 178,096 spindles now in production!

Yes, it's a fact—yarn twisted on the U. S. Acme Face Drive Twister goes DIRECT to the quilling or high speed warping operation without redrawing! It's a time and cost saver, a production booster that turns out top quality knotless packages from 1-lb. to 1½-lb. WRITE FOR COMPLETE INFORMATION . . .

U. S. TEXTILE MACHINE CO.
700 GILLIGAN ST.
SCRANTON 8, PENNA.

Shorts and Remnants

We Never Know

When copies of TI fail to reach a subscriber because he has moved and has given us no new address, the copies are returned to us by the post office. That happened recently on a copy to Chicago, but when we opened the TI wrapper—there was no TI; inside was a copy of "Ebony."

Something new all the time.

Belt Dresser

"Would you kindly inform us where we may purchase an automatic belt dresser as described in the December 1950 issue?"

J. HOWARD THOMPSON
Barre Woole Combing Co., Ltd.
South Barre, Mass.

► Patent is owned by W. C. Waters, Swift Mfg. Co., Columbus, Ga.

Splicing

"Your issue of December 1950 contains an article entitled 'Splicing Plied Yarns' by Horace L. Pratt which was of interest to us . . . possible to furnish two more copies."

W. W. JOHL
President
Wm. Johl Mfg. Co., Inc.
Mystic, Conn.

Rats, Charts, and Waste

" . . . shall be obliged . . . send me reprints of 'Aw, Rats,' 'Mill Performance Charts,' and 'Tips on Processing Cotton Waste.'"

L. D. VORA
Asst. Spin. Master
Empress Mills
Nagpur, India

► All articles requested appeared in October 1950. Reprints available only on "Rats."

Don't Burn 'em

Many mills file their copies of TEXTILE INDUSTRIES for reference because much of the published material is valuable throughout the years. Paper is becoming scarce. So if you do not retain your copies of TI, please don't destroy them.

You can criticize 'em, cuss 'em, stack 'em, or anything else, but please don't burn 'em. Paper brings a good price on the waste paper market. Ready outlets are Boy Scouts, civic organizations, schools, and churches.

During the last war paper was in short supply. Many magazines had to go to cheaper grades, placing a burden on the reader.

You will be doing a good turn to sell all waste paper through one of the bona fide outlets.

Somebody Reads S&R

". . . in your January 1951 issue [S&R] I note reference to an article which appeared in an earlier issue, entitled 'Practical Quality Control System' by Frank L. Byrd. Somehow I overlooked this article and I am unable to locate it in my file of back copies of your magazine. Will you kindly tell me the issue and page number where I will find the subject article?"

MILL NAME WITHHELD

► June '50, p95-98. Index of articles, which appears with each December issue, will list other information on quality control.

Annunciator System for Tricot

" . . . 'Annunciator System Saves Time' . . . would appreciate your forwarding this copy to us."

BETTY W. FEE
Philip Wick Company, Inc.
New York, N. Y.

Warping Article

". . . would appreciate it very much if you would send me three reprints of the article, 'The Maintenance and Operation of Cotton System Warping Equipment as Used with Magazine Type Cone Creels,' by John C. Bodansky, as appeared in your January '51 issue of TEXTILE INDUSTRIES."

LANE C. DRYE
Asst. Supt.
Linn Mills Co.
Landis, N. C.

► Reprints are available.

"Yes sir, the opportunity is here for intelligent selling . . . . ."

The opportunity for salesmanship is greater than ever.

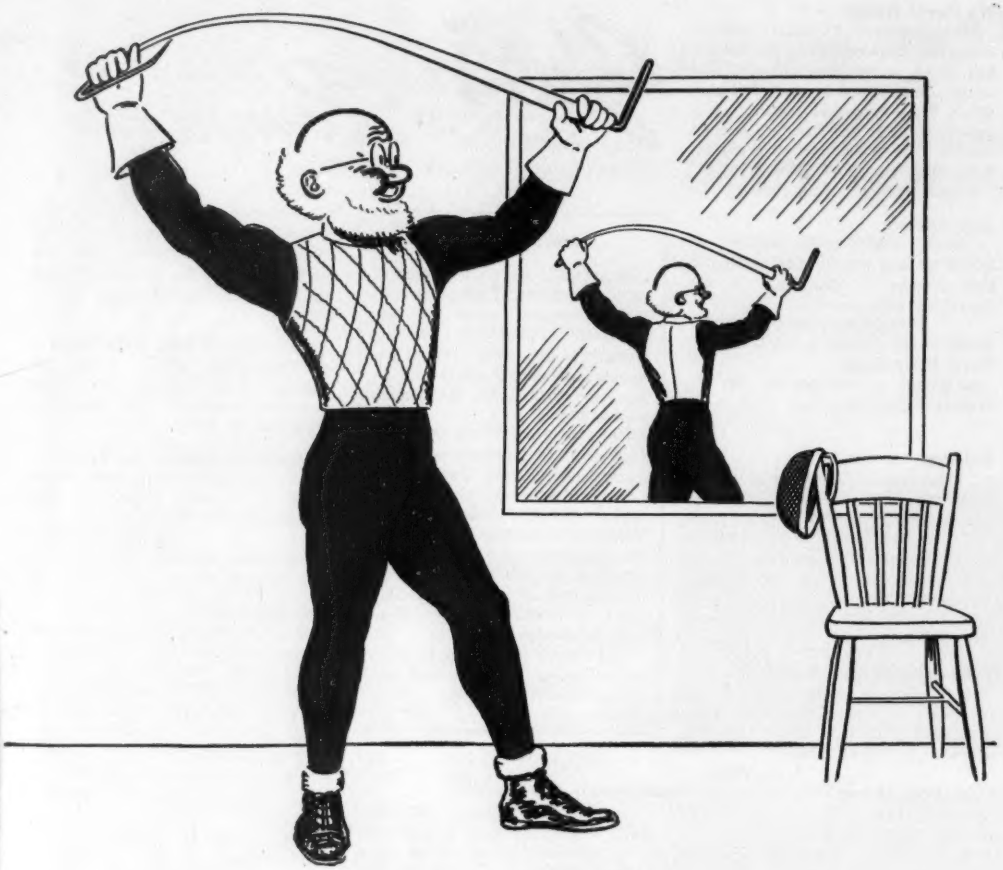
One of TI's advertisers was pondering his 1951 plans and wondering how he could cash in more effectively on his advertising. His idea of reasonable sales results was shattered when one of his men who had retired was replaced with a new man who started producing unexpected business.

A check revealed the new salesman was calling on accounts which his predecessor had passed by . . . a further check showed the other "salesman" was in an established route and rut, calling on only those whom he had been seeing for many years. The new man was using sales folders and showing ads to answer buyers' questions; the oldsters had used hardly any of this sales material.

It reminded us of another company that had started advertising in TI and was alert enough to ask us to write to their salesmen and explain the value of the advertising to them, and a letter came back promptly from one of the men thanking us for our comments. This company believes in merchandising their advertising to their own organization.

Trying times are undoubtedly ahead. Watch the salesmen who call on you . . . particularly those with material shortages and delivery problems. Some may be able to give you suggestions on maintenance to prolong the life and efficiency of the equipment they have put in your mill . . . some will have service angles to offer . . . some will be apologizers only . . . some won't even call.

Yes sir, the opportunity is here for intelligent selling so that you will welcome the call of the real salesman . . . and he and his company and you will benefit from the relationship.—M.L.D.



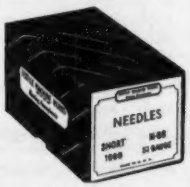
Unusual Flexibility

In a fencing foil . . . or a Spring-Beard Needle, flexibility is essential.

Textile Spring-Beard Needles provide a unique combination of strength and flexibility. Every dimension—length, width, thickness, taper—is carefully calculated in direct relation to the resiliency of the steel and the job the needle must do.

Flexibility is another of the many advantages obtained through Textile's quality controls—automatic and electronic—which constantly check each stage of production. You'll see the difference in better fabrics, increased profits.

TEXTILE MACHINE WORKS, READING, PENNA.



Textile
SPRING-BEARD NEEDLES
For Full Fashioned and Warp Knitting

Textile Industries
Vol. 115 • March, 1951

ACTIVITY VECTOR ANALYSIS test under discussion between interpreter and the person who takes it. Although this is not always possible or practical, it opens wide areas for helping people who have weaknesses which have handicapped them or strengths which have gone unexploited.

Activity Vector Analysis

—*a forward step in human research*

By **BILL EASTMAN**
Bachmann Uxbridge Worsted Corp.

EXCLUSIVE

MANY progressive manufacturing companies doing business today buy insurance policies on the future by setting up a research department. They will tell you, if you ask, that only by constant progress—the end result of research—can they hope to keep pace with their competitors and continue to grow.

So they research machinery for better, more economical ways of making their product.

They research their product for new and better things to make which will appeal to the buying public.

They even research this buying public to determine what it wants, then make an effort to meet its demands.

In fact they research just about everything except the one thing which makes the whole thing tick . . . the little guy who runs the machine which makes the product which provides the funds which support the research which etc., etc., just like the house that Jack built.

Or, more simply, it amounts to just this: When a loom goes sour, it is not just discarded and a new loom moved in; it is fixed. In fact, there are specialists, "fixers," who, by their very name, assure the performance of the loom. Yet if the weaver who runs the loom goes sour, the accepted practice is "Fire the so-and-so" and get a new weaver. Weaver "fixers" are few and far between—to the point of being non-existent.

All this (despite the simple logic) money and time are being spent on the lesser investment, the loom the weaver runs.

And it is simple logic. The amount of money paid the weaver during the 20 years a company

takes to amortize the cost of his looms, usually runs from double to triple the loom cost, at least in worsted textiles.

Efforts in Human Research. Many companies have made an attempt to correct this imbalance between machinery and human research. By and large, however, they were able to scratch only the surface with such things as eye examinations, finger dexterity tests, careful interviewing procedures, and follow-up processes which were aimed at trying to discover "on the job" characteristics.

Almost no one attempted to probe beneath externals to try to discover what lay beneath . . . in other words, to measure temperament in an effort to match a man to a job.

Some few tried, but the process was so long, so complicated, or so costly, it could not be used on a day-to-day basis at all levels. Everyone knew the temperament factor had a large bearing on a man's success in a job situation, but there were no measures available to give the clues. In fact, most of those working in the field of human research were pretty well convinced temperament was so complicated, so complex there could never be any short-cuts, that only by giving batteries of tests, conducting lengthy interviews using well-defined techniques, could a person's temperament be brought into the light.

TAKING THE TEST. Less than 10 minutes of his time were required to complete the single-sheet form. Scoring and interpreting the test will take another 5 to 10 minutes. Despite its deceptive simplicity, Activity Vector Analysis is rolling up an impressive record for its high degree of accuracy at Bachmann Uxbridge.

Measuring Temperament. Fortunately for those who are convinced human research should take its rightful place along side of machinery research, a new temperament measure has been devised which shows great promise. The product of 15 years of continuing research by a qualified industrial psychologist, plus more years of careful and conscientious validation, this measure has won many friends since it was first made available to industry about two years ago.

Called Activity Vector Analysis by its author, Walter V. Clarke of Barrington, R. I., it is usable on a day to day basis for screening all applicants at all levels. The applicant can take the test in less than 10 minutes. Scoring and interpreting the test takes another five minutes.

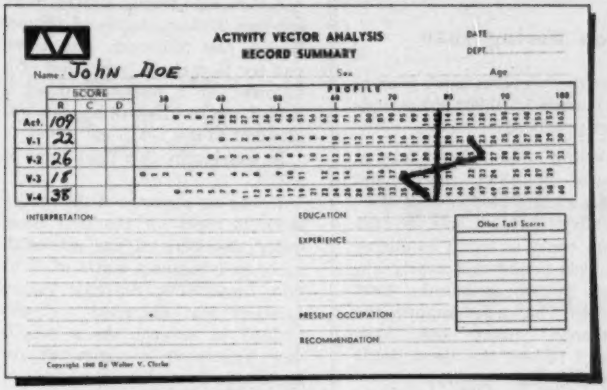
No psychologists are needed to interpret the tests. Men selected from each organization are trained to administer, score, and interpret. There are no time-consuming delays during which the tests are sent away for scoring and interpretation. If an immediate answer is needed as to whether an applicant is temperamentally suited for a particular job, it can be determined in the aforementioned 15 minutes.

Naturally, before a man can be recommended to a specific job, the job must be studied to determine its temperament characteristics.

In places using Activity Vector Analysis, the old adage "He's a square peg in a round hole" takes on new meaning because when this situation becomes apparent, a means is at hand to find a square hole for the square peg.

Quite naturally, the first question asked by those interested in the test, especially anyone who has any knowledge of psychological testing procedures is: "Is the test valid?" It looks too simple, too uncomplicated to be true. Yet there is, after one understands it, no aura of mysticism about it because it can be explained in rational, logical terms.

The author of Activity Vector Analysis can produce literally mountains of validation material, much of it couched in terms too technical for the layman to understand. Possibly of more importance is the question, "How does Activity Vector Analysis work in the plant?"


ACTIVITY VECTOR ANALYSIS
RECORD SUMMARY
Name: John Doe
Sex
Age
Date
Dept.
SCORE
R C D
PROFILE
Act. 109
V-1 22
V-2 26
V-3 18
V-4 35
INTERPRETATION
EDUCATION
EXPERIENCE
PRESENT OCCUPATION
RECOMMENDATION
Other Test Scores
Copyright 1948 By Walter V. Clarke

CHARTING THE TEST SCORES. Form as shown is used and interpreter is ready to go to work. Although meaningless to those who have not had the training program necessary for certification as a user of Activity Vector Analysis, the pattern reveals to the interpreter the many facets of the person's temperament and indicates to him the job possibilities where the person can be expected to reach his highest potential.

Plant Usage. Each user of Activity Vector Analysis, to date, is most enthusiastic about the performance of the test. Its scope has been greatly enlarged. Selection and placement is first, but additional uses are being found every day. The field of safety is being thoroughly explored, and there are gratifying signs that much progress will be made in this area. So-called "accident prone" people can be removed from machines or places which constitute hazards.

Absenteeism has been discovered to result frequently from mismatches of temperament and job. Success has been almost spectacular in many cases where machine operators were promoted to responsible positions, many times over the objections of certain segments of management.

Fundamentally, the performance of the test must be related closely to the experiences of each user as an individual, and interpreted in the light of what he has been able to accomplish with it. What follows then, based on the personal experiences of the writer of this article and using the test on a day-to-day basis, is the story of a great many successes—some failures.

Experience at Bachmann Uxbridge. We have been using the Activity Vector Analysis program in our mills for more than a year. During that time I have personally administered more than 2,500 tests. In discussing the tests with those people who took them, I have been called wrong less than 5% of the time. There have been instances where emotional disturbances have distorted the picture to the extent where interpretation was difficult or impossible. Eliminating these, the 5% figure is greatly reduced. It has been my experience that in a literally amazing number of cases, the tests have been most accurate, so accurate, in fact, that this analyzer has frequently been hesitant to report what he sees.

The tests have been used to fill jobs at all levels. Our failures as compared to our successes have been so few it has been difficult for even skeptics to find fault. Actually, some of our infrequent failures have resulted not from the test's accuracy, but from the failure of the interpreter to take into consideration all aspects of the picture he saw in front of him.

Two comprehensive job studies using Activity Vector Analysis have now been completed. These reveal, perhaps better than anything else, what can be expected of the test.

One hundred fourteen sewers (menders) were given the A.V.A. test. Using only those findings, an attempt was made to predict which of the group would have above average and which would have below average earnings. After the selections were made, they were compared to the sewers' actual piece rate earnings over three months. A.V.A. was right in over 80% of the estimates. There were only five bad misses in the group, the rest were borderline. In three of the five bad ones, there were emotional disturbances which colored the picture.

From the findings of the test it was possible to establish standards which are now being used most successfully in the selection of both experienced sewers for work in our plants and in the selection of young people for training.

It was also discovered that the manual dexterity requirements used for selection for many years are not valid. The prime requirement for sewers is "sittability"—the ability to sit quietly over an eight-hour day without becoming nervous or finding it necessary to take too many trips to the smoking area or rest rooms.

The outcome of the weaver tests, conducted along similar lines and involving over seventy weavers, showed 87% predictability on the above/below average scale.

Attacking the problem in a little different way, a careful job analysis of loom fixing was made, using a form which converts the elements of a job into the vectors measured by the Activity Analysis Vector test. After setting up the loom fixer standards, it has been possible to make approximately half a dozen selections when job openings occurred. Every one of these has turned out well. Incidental to the job analysis, after the standards were set up, many of those then employed as loom fixers were tested in an attempt to validate the standards. Almost without exception, the weak and the strong could be separated. In addition, three men were selected for promotion and advancement. All are winning the praises of their superiors.

Other Applications for Analysis. A. V. A. has selected men at both high and low levels. A number of salesmen who had temperaments compatible for that type of

World Rayon Production During 1950

Surveying world rayon production during 1950, the "Rayon Organon" estimates that, based on reports from six to eleven months operation during the year, the total global output was approximately 3,500,000,000 pounds, an all-time high level. The 1950 estimate represents an increase of 29 per cent over the previous year.

Rayon filament yarn produced throughout the world last year is estimated at 1,900,000,000 pounds, an increase of 16 per cent. Total world output of rayon staple last year is estimated to have been 1,600,000,000 pounds, an increase of 50 per cent, compared to 1949. Staple output, however, was only 50,000,000 pounds more than the previous peak year of 1941 when 1,550,000,000 pounds were produced.

During the first eleven months of 1950, the United States imported 80,575,000 pounds of rayon staple, or over seven times as much as during the 1949 period and nearly 2½ times the eleven months' total in 1948. The larger imports, the "Organon" points out, have helped relieve the tight staple supply in this country.

Rayon filament yarn is also coming into the country at an accelerated rate; but in relation to domestic output, the quantities are small. Through November, 5,083,000 pounds were imported.

work, but who had little previous experience are showing great promise. Supervisors, designers, trainees, and others in many different classifications are performing as predicted. There are literally hundreds of cases which could be cited.

At lower levels, the test appears to be equally effective. For instance there was the deadly repetitive job which had changed hands five times in a period of weeks. The overseer was desperate. Aside from the repetition, there was the added distraction of a group of girls working nearby.

After a job analysis was made, a man content to do that kind of work was selected. As an added attraction, a person with strong family attachments was picked. The result? The overseer has been to the personnel department several times in the months since the selection was made to praise the operative. The employee, in turn, says it is the best job he has ever had.

The Negative Benefit. Perhaps one of the greatest benefits to be derived from the use of the A.V.A. analysis might be called a negative one, since it involves keeping out of our mills people who, when tested, show up as emotionally unstable, accident prone, or incompetent. Admittedly, we may make a few mistakes, may miss a few good employees in our screening process, but on the whole, we believe this particular aspect of the A.V.A. will pay great dividends as more and more of our working force is selected with the aid of A.V.A.

It is impossible to tell the complete story of our use of A.V.A. For instance, it has been used successfully in many instances in discovering why a man who shows great promise fails to deliver. How a job transfer has literally performed a mircale. Because A.V.A. pinpoints what is wrong in a man's temperament, it offers wonderful opportunities for helping him.

It has brought to light such things as emotional conflicts which seriously handicap a man in the performance of his work. Once these conflicts are out in the open, the person can be aided in removing them. It has revealed that some men can be transferred from plant to plant, job to job, without fear of jeopardizing their effectiveness. Others resist transfers, even promotions, if it means an interruption of habit patterns which have been built up over the years.

A.V.A. also shows clearly there are two distinct classes of people: leaders and followers. And when you try to make a leader out of a follower, or a follower out of a leader, the results will be most unpleasant to see.

In conclusion, this final story of A.V.A.

It was my pleasure at the textile show to meet for the first time, many members of the editorial, sales, and business staffs of TEXTILE INDUSTRIES. Activity Vector Analysis was discussed and explained to several. As a result, they expressed a somewhat reluctant desire to take the test.

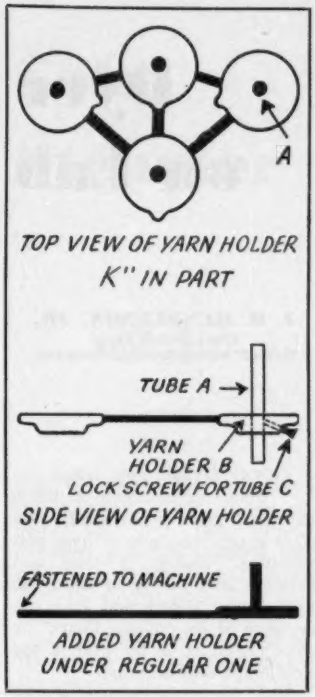
Despite the noise and confusion and many visitors present at the TI booth, the men filled in the simple test form. They were scored right then and there, and analyses given verbally.

The air of skepticism which pervaded the booth during the discussion became one of incredulity, when the opening remarks for one fellow's analysis went something like this: "You need to slow down, you are entirely too nervous, too tense, your pattern shows that you are actually expending energy at a rate which is faster than you are replacing it."

It was at this point that the man turned to another and asked, "Did you tell him to say that?" It seems he had gone to a doctor only a few days before and had been told exactly what the test pattern showed.

To make a long story short, just about everyone on the TI staffs were A.V.A. tested, and in not a single instance was the analyzer called wrong. In fact, some of the people tested accused him of crystal ball gazing because of the uncanny way in which the test brought out things they felt were pretty well hidden.

I am sure the large majority of the TI men tested are convinced they saw a valuable personnel tool in operation. It is not the be-all, end-all, but if used with intelligence, understanding, and thoughtfulness, A.V.A. has great possibilities and is a step in the right direction in reducing the imbalance which now exists in most companies between machinery research and human research.



Tip for makers of seamless nylon hosiery

Modified Threading

To Knit Heel and Toe on Model K Machines

EXCLUSIVE

This practical suggestion was submitted as an entry in one of TI's "Kink" contests. One is in progress at this time. For details, please turn to page 175.

WHEN two ends of nylon are run together in making the heel and toe on Model K and similar machines, it is desirable to have the ends twisted together to prevent separation in knitting. The ends will twist together enough to prevent separation if they are fed from cones mounted one above the other.

A satisfactory arrangement is to have one end pass through a tube and to a cone above where the two ends become twisted together. The tube does not have to be any special size; however a ¼-inch tube serves the purpose well. This arrangement permits the yarn to be drawn directly off the bottom cone, and yarn from the top cone twists around it, thereby preventing separation of the two ends during knitting. The two ends are run together on the heel and toe yarns only.

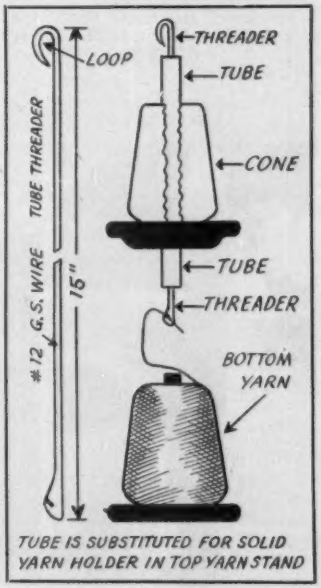
As shown in the accompanying illustrations, a tube is substituted for the yarn holder in the top stand, and an additional bracket can be supplied to support the bottom yarn stand. The tube threader can be easily made in the mill shop and should save much time in threading the yarn from one cone through the other.

The threader is made of No. 12 galvanized soft wire, is 15 inches long, and has a small loop on top for hanging on the machine when not in use. The bottom end of the threader is flat and has a small diagonal slot to hold the yarn in the threading operation.

When the yarn runs out or breaks on the bottom yarn holder, the tube threader comes in handy. In use, the threader is inserted through the tube support on the top cone holder and extends through the bottom of the hollow tube. Yarn on the bottom stands is passed through the slot on the threader, drawn up through the top tube, and is tied to the end on the cone above.

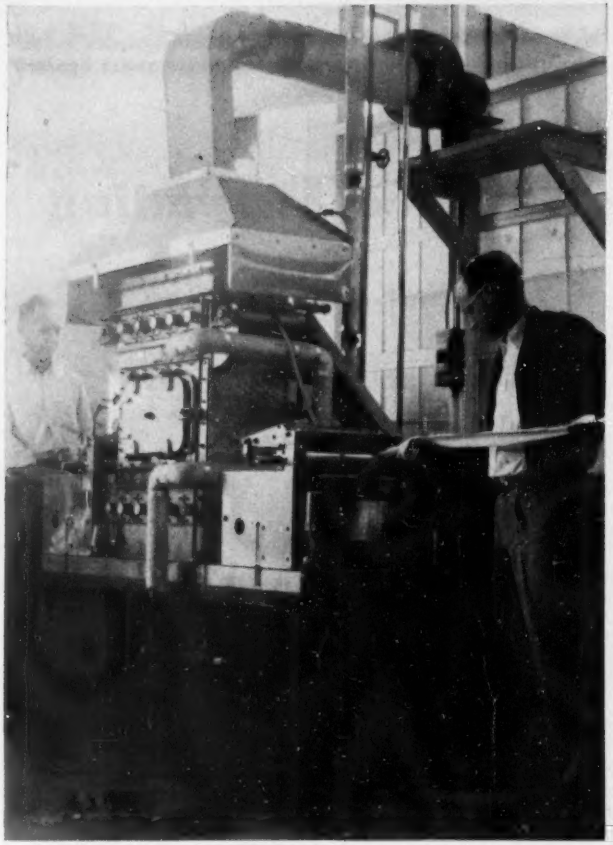
CONTRIBUTOR No. 8243

Details are shown in this and the sketch at the left above.



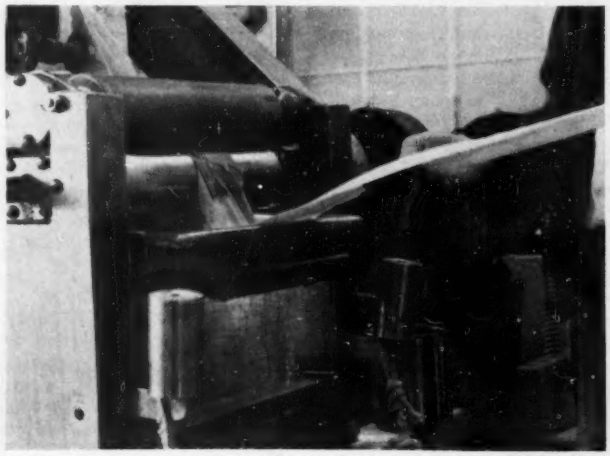
Dyer on Lab

J. H. HENDERSON, JR.
Piece Goods Dyer
Russell Manufacuring Company



FEEDING THE LAB STEAMER. George Smith, laboratory technician, is feeding a hand patch into the lab steamer. Gaston Nolen, assistant dyer, is lending a hand at the doffing end.

CHEMICAL PAD on laboratory steamer (close-up).



A GOOD DYER once listed the things necessary to match a vat dyed piece goods shade—the right equipment, proper dyes and chemicals, plenty of time and patience, and plenty of cloth. He might have added that long experience or an unusual knack for color matching on the part of the dyer helps considerably.

When the Russell Manufacturing Company procured a DuPont type steamer for the Bleachery Division the equipment problem was mostly solved. Dyestuffs and chemicals were readily available. Patience could be practiced but neither time, cloth, experience, nor unusual abilities were available in sufficient quantity to make our color matching job an easy one.

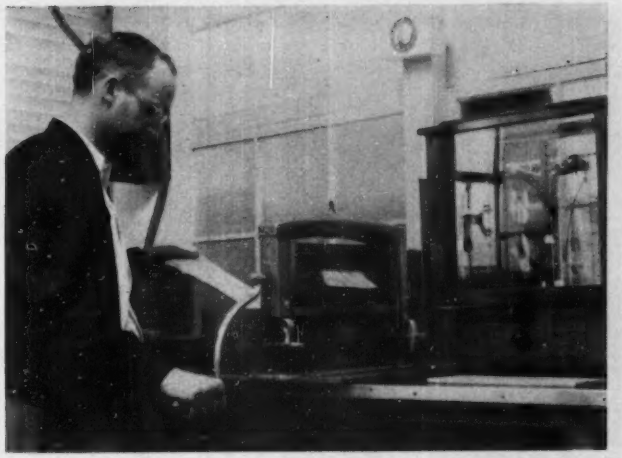
We had learned how to obtain results in the laboratory that were helpful in our jig work, but taking one jig out of production to match a shade was quite different from tying up an entire dyeing range to match a shade. The management of the Bleachery Division recognized this problem soon enough to provide a laboratory steamer along with the mill steamer.

The laboratory steamer, which is of stainless steel construction, includes a chemical pad, steamer unit, a set of squeeze rolls at the exit, and a small variable-speed power unit. Essentially, it creates heat and moisture conditions identical to those created by the regular mill steamer.

Duplicating Mill Conditions. The

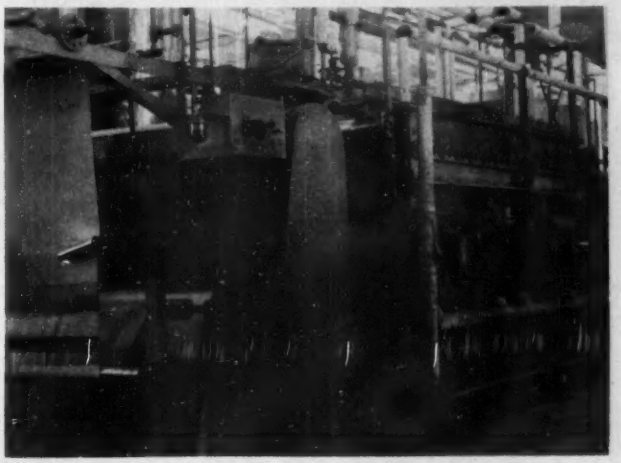
Sold Steamer

EXCLUSIVE



CLOTHES WRINGER is used for dye pad in laboratory.

MILL CONTINUOUS STEAMER UNIT. Strike-offs can be costly here. Laboratory steamer saves time, labor, cloth, and chemicals.



mill procedure for vat dyeing woven goods is: pad on the pigment, flue dry, pass through chemical pad into steamer unit, cold rinse, oxidize, soap, rinse and dry—all continuously. The heart of the operation is the steamer.

In the laboratory we weigh out the dye on precision balances, pad the pigment onto the hand patch through a home laundry hand-operated clothes wringer, and dry it rapidly and uniformly in a special metal cabinet outfitted with heating lamps. The dry pigmented cloth is then attached to a leader tape and passed through the laboratory steamer chemical pad which contains a solution of hydrosulfite and caustic identical to that used in the mill chemical pad. From the chemical pad it is fed automatically into the steam unit.

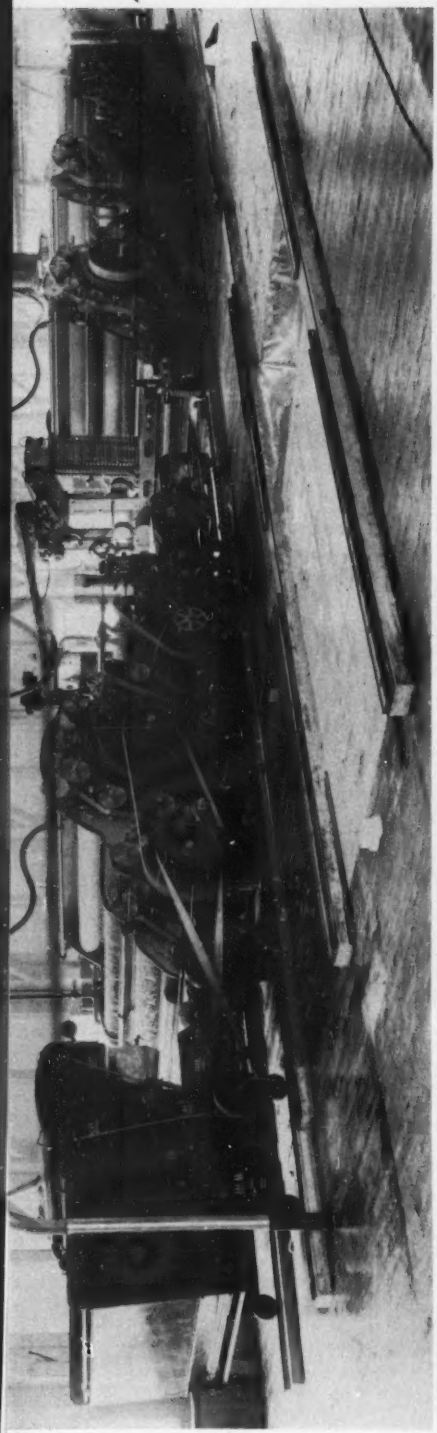
The speed of the laboratory steamer can be so regulated that the time it takes for the passage of the hand patch through the steam unit can be made to closely approximate the time it takes a piece of woven goods to pass through the mill steamer. The hand patch is then removed from the leader tape, cold rinsed, oxidized, soaped, and rinsed in a beaker. All of these operations are carried out by the dye department laboratory technician, George Smith, who also does other special laboratory work for the bleachery in his spare time.

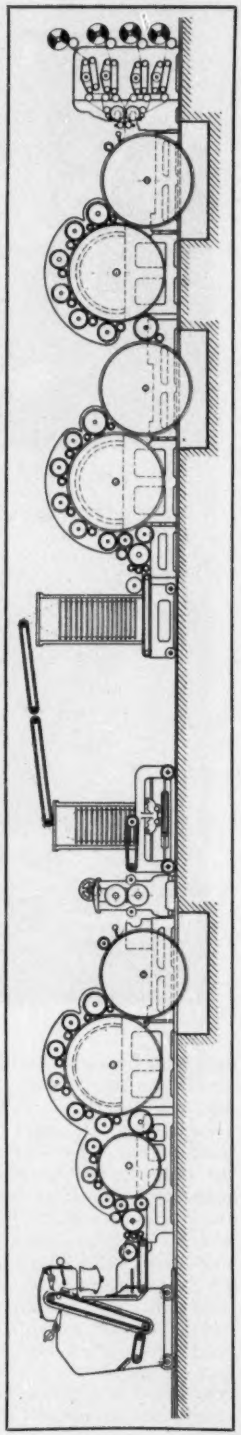
Results with Laboratory Steamer. The laboratory steamer results have been most gratifying. In the first place, when a shade is matched using it, we can be fairly certain that the shade can be matched using the same dyes on the mill steamer. In the second place, the number of times that the laboratory results have permitted rapid mill matching of shades far out-number the times when the correlation between laboratory and mill results was poor. We have actually had as much shade discrepancy trouble between mill strike-offs and mill runs as we have between the laboratory result and mill strike-off.

A strike-off on a shade in the mill entails the same dye weighing, padding, drying, and steamer operations as a regular run. The only difference lies in the use of long pieces of leader cloth and short pieces of the goods to be dyed. This process consumes labor, production time, scarce cloth, chemicals, and dyestuff.

For a medium shade, the pigment pad solution may cost as much as a dollar a gallon. A bad guess on the part of the dyer—and no matter how good he is, he's guessing—can cause the loss of

(*Continued on page* 206)





THE FIRST of the four new tandem style, three-cylinder, Duesberg-Bosson cards to be erected at Dorr Woolen Mills in Guild, N. H. Since this photo was made, the other three units have been placed in operation. Note the rails and sheet-metal-lined pits on floor at right of machine, ready for erecting crews to begin assembling the second card. The pits accommodate the 50-inch doffer cylinders which project 7½ inches below the surface of the floor, as shown in the diagram below.

Dorr

FIRST REPORTS of an American mill's experience with the Duesberg-Bosson card, a machine developed from a background of over 115 years and which incorporates many advanced features of its European prototype, comes from Dorr Woolen Co., Guild, N. H. Here, four tandem style, three-cylinder sets with automatic hopper feeder, intermediate parallel fiber feed, Peralta machine, and tape condenser, have been installed.

In comparing the new cards with previous equipment, George A. Dorr, president, states: "We can say surely that we are now getting double the production of a 60/60 with Peralta rolls on our type of stock." A portion of this increased capacity can be attributed to the wider, 78¾" cylinder and roller face width which this machine features, but many fundamentally good engineering practices built into the machine account for the balance.

First impression is one of apparent structural rigidity in both stationary parts and light weight moving parts. Analysis of the construction confirms this. Closer inspection reveals that components are generally machined to fine tolerances while more than cursory attention seems to have been given to the bearings.

Located on the third floor of the mill, the massive 62' 3½" long and 11' 8⅛" wide machines are supported by steel plate and heavy planking over structural steel beams. Head room is 7' 6". A 1½' deep sheet metal pit is sunk in the floor beneath each doffer cylinder to allow clearance for the 50" diameter roll which projects 7½" below floor surface.

Carding machine frames are heavy cast iron sections mounted on machine finished cast iron floor

Woolen Installs New Wide Cards

Staff Prepared

EXCLUSIVE

HIGH PRODUCTION Duesberg-Bosson machines feature, among other things, 78¾" cylinder and roller face width, centralized pressure type lubrication, large capacity hopper, 36-inch metallic breast with automatic burr remover, pneumatically loaded Peralta rolls, and Belgian type parallel fiber intermediate feed.

rails. The rails distribute the load uniformly throughout the total length of the machine, and are unique in that they provide for movement of each section of the card as an independent unit.

When grinding, mounting card clothing, inspecting, repairing, or cleaning, the mobility afforded by these rails saves considerable time in separating or assembling sections and insures instant realignment without effort.

Construction. Cylinders and rolls do not vibrate at high speeds because of their uniform and balanced construction. Workers and fancy rolls are composed of tubular aluminum sections with steel journals. Their light weight facilitates removal during card grinding.

The arch members which support workers, strippers, fancy rolls, and other members outside and around the cylinders are made of box sectional type cast iron construction. Poppet locks are designed to prevent rolls and bearings from getting out of adjustment after gauge setting.

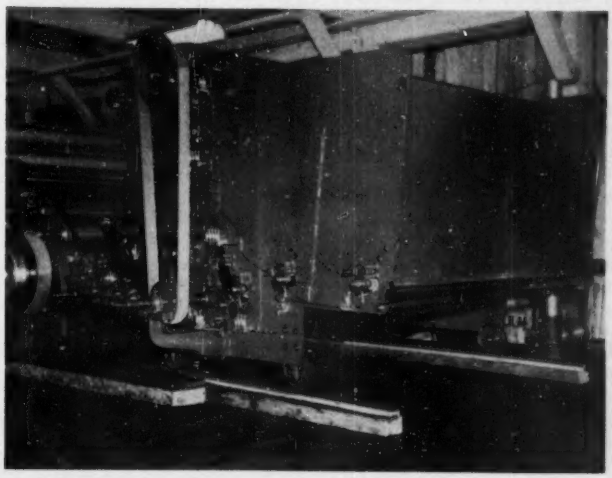
Machine cut gears are used throughout. These can be set to correct running clearance on all drives. Pulleys are machined and balanced. All other parts are precision machined, thus permitting easy assembly and interchangeability.

Diameters of major rolls are:

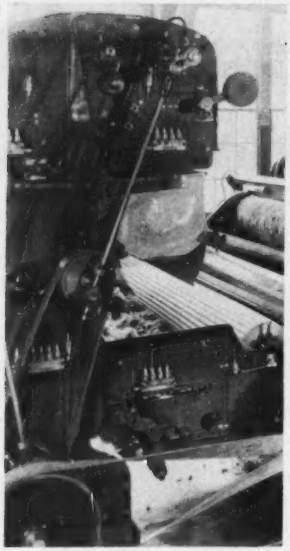
Breast	36"
Main cylinder	55"
Doffer	50"
Worker	8⅝"
Stripper	3 9/16"
Fancy	12"

Main cylinders, doffer cylinders, and breast cylinders are mounted on self-aligning spherical roller bearings while other rolls and shafting are furnished with self-aligning ball bearings. On medium and slow speed rolls and shafts, self-aligning bronze bearings are used.

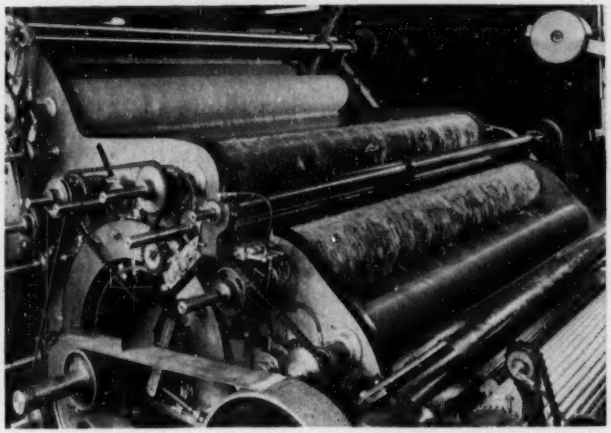
Lubrication. It follows that such a complex, precision machine would call for a flawless and highly imaginative lubrication scheme. The cards at Dorr are completely equipped with a centralized pressure type lubrication system devised by Lincoln Engineering Company. By means of it, a metered quantity of lubricant



A LARGE CAPACITY HOPPER is provided in the automatic card feeder. It holds from 150 to 200 pounds of stock. As shown in this side view of the hopper and breast section, units are mounted on rails so they can be separated from cylinders without disturbing alignment for convenience of inspection, maintenance, and repair. The hopper may be rolled away, but the breast section must be cranked out by pinion gear, and rack.



BEARINGS are lubricated by a centralized pressure system which distributes lubricant through injectors (one for each bearing), the rate of flow of which may be regulated. Typical of the lubricating arrangement throughout the card is that shown in this close-up view of the scale pan which is designed to prevent over-weighing.



AN AUTOMATIC BURR REMOVER is provided on the metallic breast. It collects burrs, dirt, and other foreign matter and then passes this material to one side of the machine by a traverse unit operating over a sheet metal trough (shown in photo) emptying into a container on the floor beside the machine.

is delivered through hundreds of capillaries to every bearing—plain, roller, or ball.

Serviced in this network of copper pipes are more than 500 assorted high-speed, low-speed, heavy-duty, and hard-to-reach bearings. SL-3 lubricant injectors, which are adjusted and set by the operator for more or less output as required, meter the lubricant to bearings while the machine is running.

Reliable and continual lubrication of rotating members is indispensible to increased speeds and higher production within the limits of the card. The machine manufacturer points out, however, that a number of these machines have been furnished with other lubricating systems and are operating satisfactorily.

At any speed, with dependable lubrication, life of motor drives and equipment is prolonged. Among other benefits which may be enumerated for the Lincoln system's application on Dorr's carding machinery are: no shutdown for lubrication, saves oiler labor, eliminates waste of oil by accurately controlling quantity used, and prevents contamination of machine parts and stock.

Automatic Card Feeder. A large capacity hopper, having room for 150 to 200 pounds of stock, is provided in the automatic card feeder. The entire steel hooded feeder is mounted on wheels running on two rails. The unit may be moved away from the breast, making breast sections easily accessible.

Sensitive feeding mechanisms keep weight and settings stabilized for prolonged periods. One of the first critical factors contributing to uniform feeding is the driven bottom apron which applies the wool stock firmly against a metal spike apron. This latter apron distributes stock uniformly to the scale pan.

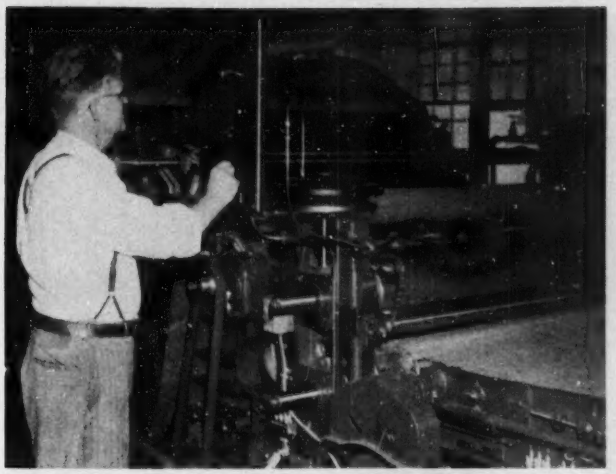
Adjustable take-up sprockets are provided for maintaining apron tautness. Large diameter pulleys, which drive the belts to which slats are copper riveted, tend to lengthen belt life by reducing flexing action.

The spiked apron stripping comb is balanced and mounted on bearings driven by an eccentric from the main shaft. This driving arrangement eliminates irregular stripping motions. Comb is mounted on stands that have a graduated scale for making corrections on both sides of the feeder to effect proper alignment with the lifting apron.

Balanced at two points and on triangular members, the scale pan is the most critical governor of roving uniformity. It is designed to prevent over-weighing stock. A retaining pan, which is open while weighings are being made, is located below the doffing comb. As the scale pan overbalances, the retaining pan closes and prohibits excess stock from falling into the scale pan. The retained material will enter the scale pan on the next cycle.

The dumping mechanism for opening the scale pan is operated at regular intervals by cam motion. Inertia is reduced by light weight, strong opening-and-closing levers. These devices assure identical scale weighings. This, in turn, minimizes the probability of light and heavy roving weights off the same spool.

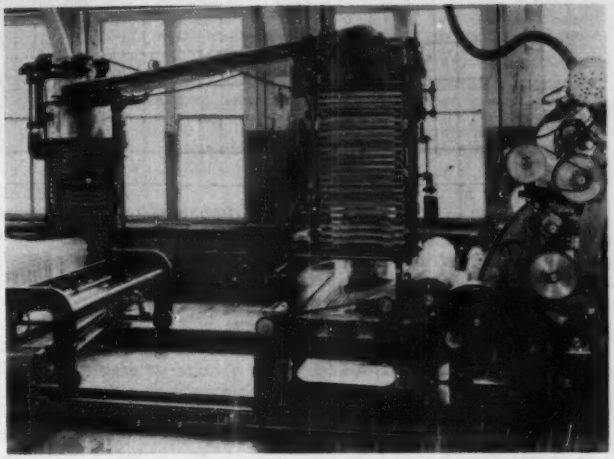
Metallic Breast. A 36-inch diameter breast is furnished with three chain-driven worker rolls and three belt-driven strippers. The large cylinder is said to aid in gently opening stock, bringing about separation of the larger pieces at low surface speed without injury to staple. The breast is



Intermediate Feed. After burr crushing, the web is laid full width on a Belgian type parallel fiber intermediate feed. This unit is depended on for much of the final blending and uniform feeding of stock. Supported for almost its entire journey to the finisher section, the wool is conveyed in a broad band.

PERALTA ROLLS have been modified with a pneumatic top roll loading device. Crushing pressures are adjustable by fingertip control on a panel board mounted on the machine.

THE BELGIAN TYPE parallel fiber intermediate feed is depended upon for much of the final blending and uniform feeding of stock. Supported for almost its entire journey to the finisher section, the wool is conveyed in a broad band.



belt-driven directly from first breaker cylinder.

Worker and stripper roll bearings and poppet bearing supports are locked to arch members on adjustable pedestals. Bearings are sealed against infiltration of dust and oil leakage. After setting the dynamically balanced rolls, supports are locked to the arch members, thereby preserving settings.

The breast unit contains an automatic burr remover which collects all foreign substance, traversing it to one side of the machine where it is channeled into a trough and then dumped into a waste receptacle.

A large licker-in between feed rolls and breast assures smooth, regular feed and effective transfer of stock. The garnett wire covering of breast cylinder and other rolls is securely fastened to the operating surfaces, then ground true and concentric with the bearing fits, and finally brushed smooth to remove burred surfaces

Peralta Rolls. Cards at Dorr are equipped with an improved Peralta machine in which top roll pressure is applied pneumatically rather than by spring pressure. The modification, developed by Foxboro Company, consists of two air motors attached to the Peralta machine by means of simple adapter plates. Panel board controls include pressure indicator, load-off and load-on air switch, pressure regulator, air strainer, gauge cock, and gauge damper.

Specification loading can be duplicated exactly for every class of wool processed. Loading is observed on the pressure indicator which is calibrated from 0 to 100 psi in unit graduations. Load or release is instantaneous. Dorr ordinarily loads to 25 psi, equivalent to 6000 pounds including dead weight of top roll. More pressure can be applied if needed. Source of air is the mill's 80-pound air line.

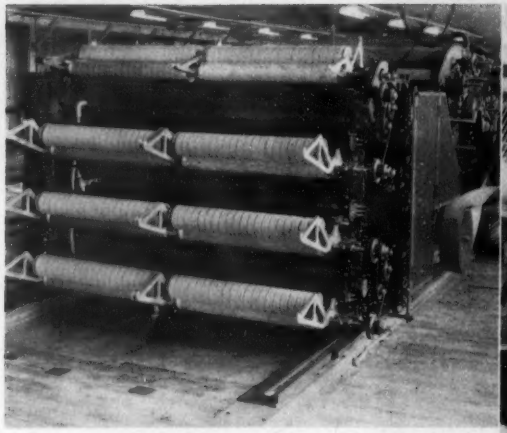
It is expected that the improved Peralta machine will mean longer life for press cylinders since unequal loadings across the bearings are impossible with the Foxboro pneumatic loading system.

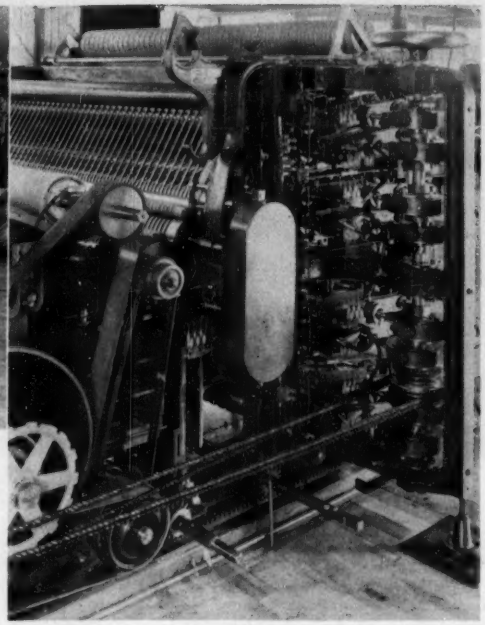
tire journey to the finisher section, the wool is conveyed in a broad band.

Fibers are laid on the finisher feed apron in the same position and direction as delivered from the preceding doffer. Regardless of the position of the feed apron, the traverse motion is at a uniform rate. Adjustable counterweights permit the traverse apron assembly to function on minimum power.

Bearings are self-aligning. Steel sprockets and roller chains provide a positive drive. The intermediate feed is mounted on tracks and can be rolled out of position when necessary.

Tape Condenser. For Dorr's re-





160 GOOD ENDS are delivered at the tape condensers on eight jackspools in four banks. Four false ends are returned to the feed by under-the-floor conduit system. Condenser may be conveniently backed away from finisher section.

TAPE CONDENSER eccentrics have 11 points of adjustment, easily accessible, and are equipped with a flywheel to aid in balancing. Each eccentric operates individually, so vibration is kept to a minimum. Note centralized pressure lubrication system injectors.

quirements, 160 good ends (plus 4 selvage ends returned to the hopper via blower) are delivered to 8 spools on the card's single apron type condenser. The aprons measure 40½ inches inside circumference. They are supported by heavy rolls in addition to a tension roll inside the top apron. The tension roll maintains better surface contact between top and bottom aprons. The long aprons and the means for positive contact between aprons assure more than adequate rubbing action. Spools are doffed at 15 inches diameter.

Bearing housings and supporting brackets are located on machined surfaces. Each eccentric operates individually. Eleven points of adjustment affecting eccentrics are easily accessible. A flywheel at the top of the eccentric shaft may be adjusted for fine balance. A lower ball bearing absorbs eccentric shaft thrust, further steadying against tendencies to vibrate. As a result of good balance, there is little or no vibration and speeds up to 500 rpm are possible.

Normal tape stretch is taken up by a calibrated adjustment unit. Tape dividing rolls are mounted in self-aligning type ball bearings. Aprons can be readily adjusted. The speed of each bank of aprons may be independently set. Also controllable are the speed and length of traverse of yarn loop shafts. Winding drums are driven by V-belts and an adjustable pitch expansion pulley.

Drive. The machine is powered by two 10 hp Westinghouse synchronous motors through V-belt directly to first breaker and finisher cylinder shafts. Measurements show that only 4 and 6 horsepower, respectively, are required for the two sections at peak loads. This power conservation stems from a combination of good machine and bearing design with proper lubrication.

The modified synchronous drive exploits to fullest advantage the low degree of inertia and resistance developing from balanced cylinders and frictionless bearings found in the Duesberg-Bosson. Breaker and finisher sections start, run, slow down, and stop in unison. This important aspect allows uninterrupted delivery of web from breaker to finisher card. One of the consequences is the elimination of intermediate feed alley tenders.

25 per cent variation in speed by motor control alone is obtainable by resetting a rheostat lever on the panel board. One control cabinet is used for the two motors. Among other characteristics of this drive are: each section can be driven independently; cards can be ground in reverse; braking action of the synchronous motors will decelerate the machine to a quick stop when necessary.

Driving units are arranged for a broad range of doffer speeds as well as worker rolls and feed rolls. Velocities of each of these subassemblies are independently regulated, thus making it possible to vary operating conditions or carding action in order to obtain best results from a given lot of stock. Dorr is experimenting with several speed combinations, in conjunction with cylinder speeds of from 92 to 120 rpm.

Two completely oil sealed comb boxes are equipped with roller bearings. Belt driven with step pulleys, these combs can run at speeds approaching 2000 rpm with insignificant vibration. The angle

of blade movement may be adjusted and set.

Other Effects. Cards are stripped by the Abington method every 12 hours or less depending on the stock. Permanent vacuum nozzle traverse mechanisms are attached to the card frames and service all cylinders and doffers. A flexible hose coupling is located in the intermediate feed alley. Pits underneath doffer cylinders are cleared by means of the flexible hose.

Despite the relatively large dimensions of the card, two men can strip the card fully in 30 minutes. The card can be brought back into full production with standard weight roving in five to ten minutes. Downtime for regrinding is cut appreciably because of the easy rail separation of components.

In addition to high productivity and labor saving offered by this card, its carding action can be translated into terms of noticeable improvement in subsequent operations. A 10 per cent rise in spinning production has been achieved. Weaving efficiency has also picked up as would be expected in the case of any good yarn. There has been a marked decrease in burling and mending as well.

Textile Research Institute Projects

Research assignments of the Textile Research Institute indicate the extensive and expanding scope of this organization's activities. Among them are: fundamentals of warp sizing, cotton fiber damage studies, structure of cellulose, structure of starch, physical-organic chemical studies of cellulose, cotton fiber properties, fiber swelling properties, properties and degradation of silk, properties of regenerated and synthetic fibers and yarns. Also, measurement of tension in textile processing, development of new instruments, review of research and development, two dimensional stress-strain studies of airship fabrics, static properties of textile fibers, etc.

National Cotton Council Meets in Biloxi for 13th Annual Convention

Staff Report

Sixteen million bales of cotton is the production goal for 1951, according to recommendations and appraisals at the annual meeting of the National Cotton Council at Biloxi, Miss., January 22-24. The large crop quota is needed to fulfill additional military demands, in addition to supplying the civilian market with the goods needed.

According to speaker William Ruffin, president of Erwin Mills, Inc., Durham, N. C., and recently elected president of the National Association of Manufacturers, production is the only answer to shortages, and taxes could hold inflation in check while industry geared for increased production. Mr. Ruffin stated further that credit controls should be imposed immediately, and the 40-hour work week should be abandoned to step up production.

Roger Fleming, secretary-treasurer of the American Farm Bureau Federation, told the group that the steps necessary to combat the basic elements of the inflation problem are to (1) increase production of many needed goods; (2) cut non-defense spending to the bone; (3) adopt a pay-as-we-go tax program, although it means drastically higher taxes; and (4) utilize strict consumer credit controls and other monetary and fiscal techniques for bringing the money supply in balance with the available supply of goods.

Recommendations for production and marketing activities were set forth by Claude Welch who stated that priority should be given to production of 16,000,000 bales of cotton for 1951, in keeping with a balanced agricultural program. Council action was suggested to insure the means to produce the crop. A proposal was made to endorse a plan to import Mexican labor to harvest cotton crops in view of a shortage of farm labor in this country.

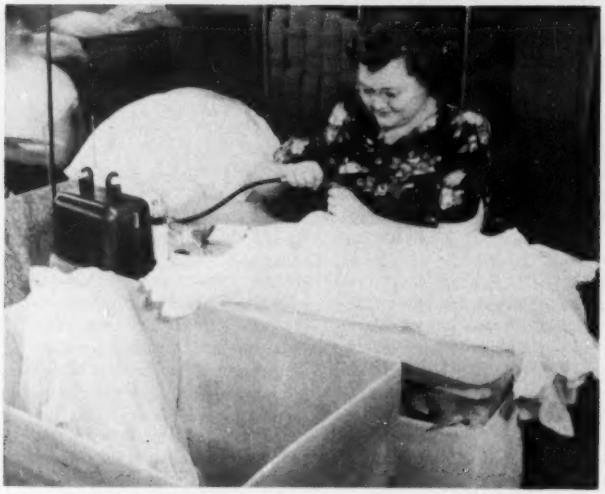
Seventeen recommendations were submitted to the Council by Mr. Welch, and one proposal indicated that the Council should make further efforts to evaluate mill requirements for cotton. It was also suggested that the organization promote a program, whereby textile schools should have the means to distinguish fiber characteristics to aid in determining processing qualities. Mr. Welch asserted that the long staple quota for imported cotton should be reaffirmed at 10,000 bales, to be altered in accordance with prevailing conditions.

A record attendance was noted at the meeting which was the thirteenth annual convention of the Council.

The board of directors re-elected Harold A. Young, North Little Rock, Ark., to his fourth term as president of the National Cotton Council. Other officers re-elected were: Oscar Johnston, Scott, Miss., chairman of the board; H. L. Wingate, Macon, Ga., vice-president; A. L. Durand, Hobart, Okla., vice-president; L. T. Barringer, Memphis, Tenn., vice-president; William Rhea Blake, Memphis, Tenn., executive vice-president and secretary; W. T. Wynn, Greenville, Miss., treasurer; and Lamar Fleming, Houston, Texas, and Robert Coker, Hartsville, S. C., advisers to the board.

(For report of the Council-sponsored Cotton Research Clinic, please turn to page 169).

The Marvel Mending Method



THE MENDING MACHINE is simple, compact, can be easily located or moved to any place in the mill, and does not take up much space. The device is leased from the manufacturer who furnishes repair parts under the lease agreement.

Machine speeds full-fashioned mending operation, is easy to use, and reduces labor turnover.

EXCLUSIVE

Staff Prepared

FORMERLY twelve grey menders were employed at Marietta Hosiery Company at Marietta, Ga. These operatives mended approximately 750 dozen pairs of hose per week. In January 1950 this company installed four Marvel mending machines, made by the Marvel Specialty Machine Company, Inc., Paducah, Ky. Now four grey menders mend picks and pull threads on 750 dozen pairs of hose per week, and these operatives don't average a full work week of 40 hours.

The mending machine consists of an electric motor and reduction gear, which drives a flexible shaft attached to the mender head. The mender head is fitted with 12 wire points arranged like spokes in a wheel. The wire points are bent at an appropriate angle to prevent snagging the hose while the hub rotates in performing the mending operation (see accompanying illustrations). All parts, except the flexible shaft and mender head, are enclosed in a small housing which rests on the operator's table. A foot-operated switch provides control of power supply to the mending machine motor.

Mending Operation. In mending a pick or pull thread, the operator presses the foot switch to the "on" position, and the mender head begins to rotate; then the rotating wire points on the head are brought into contact with the damaged area of the stocking which is in position on the mending cup. The rotating points are applied lightly so that they strike in line with the loop formation in such a way that tension on the threads is equalized throughout the damaged area, and the pull thread assumes its normal position in the fabric.

Good Results. The mending machines were secured from the manufacturer on a rental basis, and after one year of experience with them, the management at Marietta Hosiery Co. has found that the machines do a better job, the method is much faster than those formerly used, mending costs much less, and labor turnover has been reduced to nothing in the grey mending department.

Easy to Operate. When the mending was done by hand, approximately one month was required to train each operative, and labor turnover was at the rate of one replacement per month. Some difficulty was experienced in trying to train the operatives to mend by hand, using a needle, and some of the menders became nervous due to the repetitious nature of scratching out picks and pulls constantly every day.

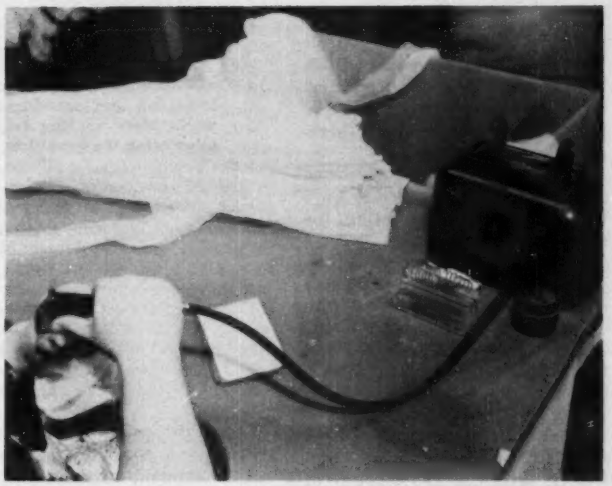
Only one week is required to train an operator to use the Marvel device, and the work is much less tiring. A mender can reach a high level of proficiency in one month

for Full-Fashioned Hosiery

by using the Marvel machine; whereas a hand mender had to have four to five months' experience to reach a comparable level of proficiency.

Maintenance. Maintenance on the Marvel machine is negligible. Occasionally a point becomes bent on the mender head, and a new one has to be installed. A jig for this purpose is supplied free of charge by the machine manufacturer, and all repair parts are furnished by the manufacturer without charge. Sometimes an operative drops the mender head and bends a point.

The speed reduction gear, which operates between the motor and mender head shaft, should be packed with lubricant once a year. It is desirable to examine each machine once a month to determine the mechanical condition of all parts, and it is essential to maintain the mender head points in perfect alignment. If the points become bent or misaligned, the work may be damaged, and the operatives' production will be decreased considerably.



MAJOR PARTS of the machine consist of an electric motor and reduction gear mounted in a small housing (right), and a flexible shaft equipped with mender head which extends from the housing for convenient use by the mender operative. A foot-switch on the floor controls the electric motor.

No disadvantages have been noted in using the Marvel machines in mending since they were placed in operation in this plant.

DAMAGED HOSE is placed on mending cup, and the operative holds the mender head in position to start the mending operation. Note the large defect in the stocking and the wire points on the mender head

THE MENDED STOCKING as it appears immediately after the job is completed. Note absence of any sign of pick or pull thread. Operator starts and stops machine by pressing foot-switch on floor under table.

Huntsville's Vibration Problem

WITH THE installation of high speed looms at Huntsville Manufacturing Co. came the problem of excessive vibration of mill building walls and floors. Mortar was loosening and occasionally a brick would fall out of the walls. Here are the details of the technique employed in alleviating the condition.

By F. J. CRANDELL
Assistant Vice-President
Liberty Mutual Insurance Co.

EXCESSIVE vibration of textile mill building walls, when high speed looms are installed above the first floor, presents a problem of determining how to reduce the wall movement.

Up to this time, the engineering profession has endeavored to solve this problem by increasing the stiffness of the structure. The use of tie rods throughout the building, either horizontally or diagonally, has been an accepted procedure. The reduction of the vertical deflection of the floor beams has been accomplished by installing intermediate columns, thereby stiffening the structure in the area in which the columns have been installed. The use of exterior buttresses, tied in to the structure at properly designed intervals has been used in a relatively large number of locations.

In all of the procedures, there has been some success in each one, and there have been disadvantages of one kind or another in each installation.

The reduction of the span of the flooring system by the installation of additional columns has interfered with the floor space and reduced the operating area available. The loosening of the tie rods in some cases has decreased their effectiveness but by and far, of all of the stiffening mediums used, the buttresses seem to have fared the best of all. Of course, the disadvantage of the buttress type of installation, as a rule, is its cost. Here we must stop to indicate that the buttress type of installation, unless properly designed, will eventually loosen up, because as we increase the stiffness of the wall, there is a very good chance that the acceleration forces against the wall will also increase, and unless the connections between the structure and the buttress are positively installed, there will be a loosening of the connection between the buttress and the wall over a period of years.

As a casualty insurance company writing compensation, public liability, and property damage insurance, we are primarily interested in the protection of the workmen and the control of property damage of our policyholders. If forced vibrations in the buildings become excessive to the point of being unsafe for the buildings, it also becomes unsafe for the workmen operating in the buildings. At the Huntsville Manufacturing Company our primary investigation showed that the buildings were safe for the operation involved, but this continual movement of the structure was causing deterioration in the walls. It was therefore the desire of A. D. Elliott, vice-president of the Huntsville, Ala., plant of M. Lowenstein and Sons, Inc., to reduce this vibration and thus increase the factor of safety of the structure, and be doubly sure that the structure would be safe for the people.

Our interest in vibration was born in 1935. The losses occurring due to damage of property by the use of explosives in excavation, we believed at that time, were in need of investigation. Our primary objective was to establish an equation that we could use to determine the amount of dynamite that could be used so that vibration through the ground would not be of greater intensity than could be safely withstood by surrounding structures.

We successfully solved this problem.[1]

It was a natural development then to proceed from ground vibrations to building vibrations. The study of the building vibrations allowed us to determine the forces that were imposed on the structure. A further natural development is now leading us into the field of the effect of vibration upon the human being. It can be readily understood that these studies are all within the scope of our company in that they all have a definite bearing upon the safety of the American workman.

Our objective in the mill wall study was to design a medium that would:

1. Reduce the actual movement of the wall.

2. Be easy to install without interfering with manufacturing operations.

[1] "Ground Vibration Due To Blasting and Its Effect Upon Structures"—F. J. Crandell—Reprinted from Journal of the Boston Society of Civil Engineers, April, 1949.

Solved

3. Be economical, and if possible, be more economical than the other types of installation.

With the objectives established, it was necessary to provide a basic theory that would meet these objectives and still be a sound engineering procedure.

The basic theory used to accomplish the objectives was to reduce the stiffness of the building without increasing the stresses imposed upon the structure at other points. This has been successfully performed in Mill No. 1, a three-story building, and Mill No. 2, a five-story building of the Huntsville Manufacturing Company.

Although it was possible to substantiate the theory of changing the stiffness of the building to reduce the vibration of the exterior wall, the actual installation would not have been possible without the advanced thinking of Mr. Elliott and the M. Lowenstein and Sons officials.

Procedure. In order to have a basis upon which to design a medium to accomplish our objectives, it was necessary to determine the dynamic forces involved in these particular structures.

The structure in which the first installation was made was a three-story building having looms on the first floor and second floor, and spinning operations on the third floor. Horizontal proportions of the building were 450 ft to 125 ft.

Due to the fact that we were primarily interested in the impact forces involved, we measured the accelerations and frequencies of the forced vibrations using a three-plane accelerograph (see illustration on page 104).

The accelerograph has three stiff reeds, and by optical transmission a light beam is used to transmit the movement of the reeds onto a 35 mm photographic film. The three planes consist of

"---Why didn't someone think of this before?"

By A. D. ELLIOTT
Vice-President and Manager
Huntsville (Ala.) Manufacturing Co.

VIBRATION PROBLEMS are not uncommon in mill buildings; in fact, ours had existed for many years. The former owners had provided additional columns under the first floor weave room. Also, they had installed a series of steel beam supports at approximately each fifth beam over the entire five floors of No. 2 Mill. These measures probably were adequate until new high speed looms were installed. Despite the fact that the loom speeds were staggered, we noticed a considerable motion in the floors and walls. We found places where the mortar was loosening, and occasionally a brick would fall out.

In our third floor card room, we could not set the cards to as close settings as we set the first floor cards in No. 1 Mill. In the spinning, the motion was sufficient to unroll the roving in the creels of frames when they were standing. We found it necessary to turn this roving back to take up the loose part so as to prevent breaking back on the start-up.

Another effect noticed in the spinning was that the frames would not remain lined and levelled for a normal period. In addition to these manufacturing deterrents, we were beginning to have more than the usual amount of sprinkler and steam pipe leaks.

The foregoing conditions were prevalent four years ago when Liberty Mutual came into the picture. Their regional engineer, recognizing the hazard of falling bricks and the possible effect on safety morale of anything adversely affecting the work-conditions, requested a survey of the vibration condition. F. J. Crandell, assistant vice-president of Liberty Mutual, made a series of vibration tests which are described in his report.

So as not to fly under any false colors, let me explain at this point that we know nothing about the technical side of vibration. These vibration engineers speak a language all their own. Many times in our conferences, we had to stop them and ask them to say it in plain old cotton mill English. We would like to pay a tribute to the patience of Mr. Crandell and D. W. Lenahan while explaining these matters in simple terms. As we understood, the first survey results showed that the buildings would not fall down, at least any time soon. This was comforting, but we learned that the trouble probably would gradually get worse, so we asked for a suggestion to correct the condition.

The first attempt was made in a small area where the beams under the second floor were stiffened by bolting steel channels to them. The test proved that this method would be expensive and that the vibration was not decreased sufficiently to correct the trouble. This left us with the only known possible correction—buttresses, which we understood would be expensive and with a possibility that they might not do the job.

It was at this point that Mr. Crandell mentioned his idea of the spring type isolators. He said this method had been successful on bridges and other heavy equipment but had never been tried on a building. To make a long story short (and it was a long story extending over many months while more vibration tests were being made, designs made and remade, etc.), we finally installed a test lot which were so phenomenally successful that we proceeded with the entire installation in both mill buildings.

To sum up our reaction to the results, naturally we were happy about the small cost as compared to any other correction. We are now pointing up our brick work and the mortar is staying. The walls are not vibrating. The floors have some motion but it is a different motion that doesn't produce the troubles we once had. If you looked at the installation you would probably wonder as we have—Why didn't someone think of this before?

one vertical plane and two horizontal planes, which we call the longitudinal and transverse planes.

With this instrument, we were able to measure the acceleration in each plane, the frequency of the forced vibration in each plane, and an analysis of the film allowed us to determine any differential in phase that occurred in these three planes.

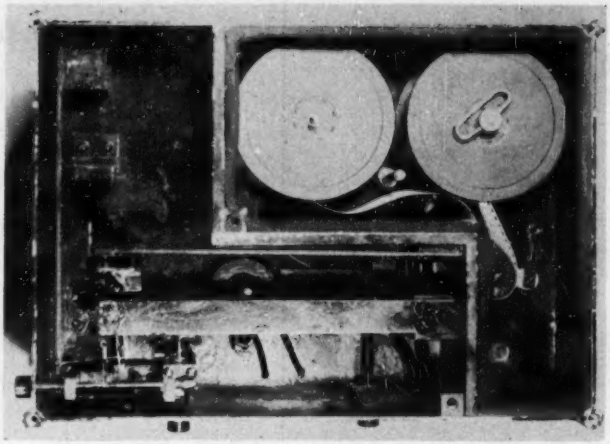
Our procedure was to measure the vibration on each and every floor directly under each other. In addition, the movement of the wall, as well as the floor movement, is measured at the same locations. On buildings 100 to 500 ft long, it is necessary to take a number of measurements at horizontal separations, in order to determine the true movement of the wall.

After taking the required measurements, the film was developed and considerable time and care were taken in analyzing the record. A typical portion of the record of floor vibration is shown on film (see illustration).

It is usually necessary to analyze at least ½-minute of continuous record to find the repetition in cycles, which is our basis of determining the number of vectors involved in the forced vibration.

The record indicates a true movement of the floors which we term the forced vibrations. In the case involved, directly longitudinal to the wall it was found that the forced vibrations contained two vectors: one at a frequency of 75 cycles per second, the other a frequency of 60 cycles a second, which produced a general beat 15 times per second. By the same token, the maximum acceleration of the flooring system imposed upon the wall occurred at 15 times per second; but in all cases, it was occurring at a high frequency of approximately 75 cycles per second.

To visualize this, it is only necessary to assume that you are hitting the wall with a hammer with increasingly stronger blows until you have arrived at the maximum, and then continue to hit the wall with decreasingly smaller blows until it comes to zero again. The wall, of course, would be resisting this battering-ram effect in a very tortuous manner.



THREE-PLANE ACCELEROGRAPH used to measure the accelerations and frequencies of the forced vibrations in the mill buildings. The accelerograph has three stiff reeds, and by optical transmission a light beam is used to transmit the movement of the reeds onto a 35 mm photographic film. The three planes consist of one vertical plane and two horizontal planes.

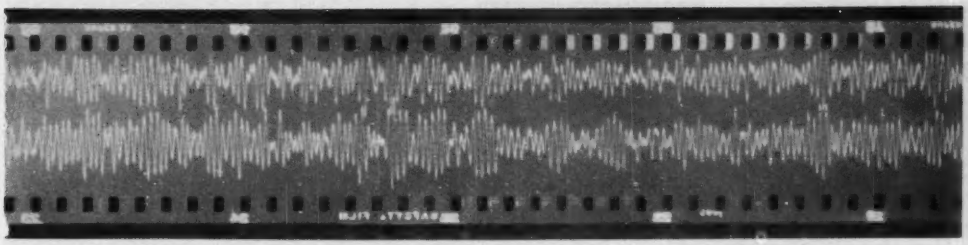
By analysis of these curves, at least ½-minute of record at each location, we were able to plot the modes of movement of the wall. A record of the deflection movements of the wall are shown (see accompanying illustration). The modes occur in a rhythmic cycle, repeating themselves periodically, but between the repeats of any mode, the other modes of vibration will be imposed upon the wall. The wall will vibrate in all of the maximum modes indicated, and a few more besides. These maximum modes of vibration can be taken as the elastic deflection curve of the wall, and from them we can determine the maximum dynamic force imposed upon the wall.

In the case in question, the maximum dynamic force imposed upon the wall was calculated to be 4,000 pounds, and the maximum displacement of the wall at the second floor was .44". With this information, it was not difficult to determine the increased fiber stress imposed upon the mortar joints in the structure, and they were found to equal the maximum tensile strength of these mortar joints. These first measurements were made a number of years ago, and a continual inspection of the building showed the mortar joints were deteriorating and breaking down.

Caution. As in all vibration problems, we must consider the possibility of resonance occurring between the forced vibration and the natural frequency of the structure. We have no easy way of determining the natural frequency of any individual structure. Therefore, it is necessary at all times to make a theoretical determination of the natural frequency of the structure depending upon its masses involved in the movement. Calculations of the natural frequencies of the building showed

Calculated Natural Frequency	Cycle/sec.	Cycle/sec.	Cycle/sec.	Cycle/sec.
f_1	.99	4.6	10.94	32.7
f_2	.535	2.48	5.34	8.07

f_1 = original structure
f_2 = structure after installation of isolators



FLOOR VIBRATIONS recorded on film are typified by this portion showing the vibration pattern.

that there were four possible natural modes of vibration that could occur.

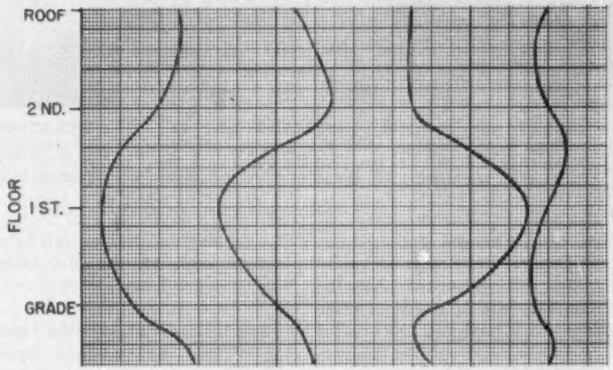
The equations for determining the natural frequency of the buildings of the Huntsville Manufacturing Company were established by Dr. Charles Norris, professor of structural engineering at the Massachusetts Institute of Technology.

If the stiffness of the structure were changed so that it would vibrate in any one of these natural frequencies, there is a good possibility that movement of the wall would be increased instead of decreased. By the same token, relieving the force on one wall might possibly increase the building forces at other locations. This in addition to resonance must be guarded against.

Isolators. Having obtained the necessary data, it was found necessary to install isolators under the floor beams in the Huntsville Manufacturing Company building on one floor only, and on one wall only. The maximum forced vibration was found to occur at the second floor weave room; therefore the isolators were installed under the weave room floor beams at the second floor level and on the north wall of Mill No. 1.

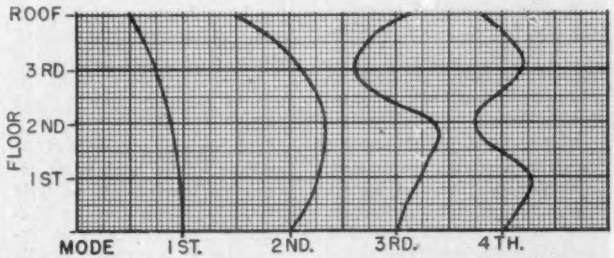
Investigation in Mill No. 2 (a five-story building) showed the maximum forced vibration at the second floor weave room level again, but the wall of smaller mass was the south wall. In this building the isolators were installed at one floor and on one wall only; under the second floor beams on the south wall.

In cooperation with Ernest B. Allen of the Allen Engineering Company of Boston, Massachusetts, spring isolators were designed and manufactured to resist the dynamic forces imposed upon the wall in all three planes: vertical, longitudinal, and transverse.



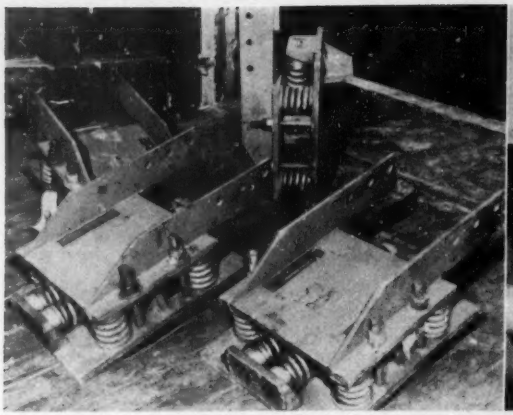
MAXIMUM DEFLECTION movements of the wall at calculated modes. The modes occur in a rhythmic cycle, and the wall will vibrate in all of the maximum modes indicated.

THEORETICAL MODES OF VIBRATION and calculated natural frequencies. If the stiffness of the structure were changed so that it would vibrate in any one of these natural frequencies, there was a good possibility that movement of the wall would be increased instead of decreased.

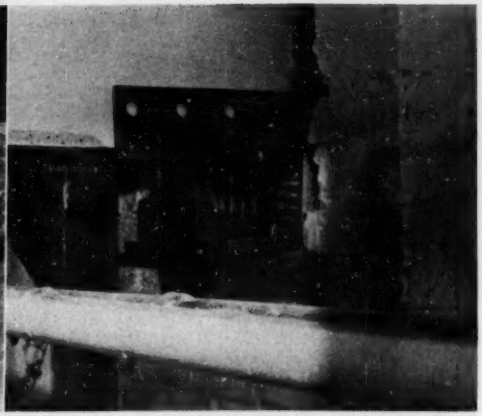


It was necessary to pre-stress all springs in order to limit the movement involved and assist in the actual installation so there would not be any unusual adjustment problems in bringing the beam back to its original elevation after the installation of the isolators. This was accomplished so well that there was not a difference of 1/16″ in the elevation of the floor beams after the isolators were installed. Additional caution was necessary to design the isolator to be as small as possible so that the structural stability of the pilasters in the wall would not be impaired.

The isolators were installed quickly and economically. The general procedure was to cut a



ISOLATORS BEFORE INSTALLATION. All springs in the isolators were pre-stressed to limit movement and assist in bringing the beam back to its original elevation after isolators were installed.



ISOLATOR INSTALLED UNDER FLOOR BEAM. Changing the building stiffness by installing spring isolators under the beams produced a material reduction in the wall movement.

suitable hole in the wall; set one steel plate at the proper elevation in quick setting cement; slide the isolators on top of the steel plate into position; lag screw the isolator to the beam, and release the pre-stressed springs. Except for patching the brickwork, the isolator was completely installed upon completion of the foregoing operations. The cost of the isolator and labor and material for the installation was $350 per beam.

Conclusions. Changing the building stiffness by installing spring isolators under the beams produced a material reduction in the wall movement. The original wall movement produced external lateral forced frequencies at all floors, and the reduction of the wall movement reduced the lateral vibrations at each and every floor.

The installation proved practical and economical. A minimum of skilled labor was required; a bricklayer and helper were employed to set the metal base plate and patch up the hole around the isolator. One preliminary installation of eight isolators was completed one week-end, and the remaining 67 were installed during the mill vacation week.

This type of vibration reduction may be used to advantage at locations where buttress installations have become loose over a period of years.

It was possible to obtain measurements before and after installation of the isolators. It should be remembered that isolators were installed only to reduce the vibration of the exterior wall. The results obtained in reducing the wall movement are as follows:

MILL NO. 1 Wall at:	Percent Reduction In Wall Movement
1st Floor	80%
2nd Floor	65%
3rd Floor	88%

MILL NO. 2 Wall at:	Percent Reduction In Wall Movement
1st Floor	0%
2nd Floor	50%
3rd Floor	75%
4th Floor	0%
5th Floor	65%

Dual Program Set For Silk and Rayon Prints

A dual program to accelerate the effect of renewed public interest in silk and rayon printed fabrics has been launched by the newly formed Silk & Rayon Print Institute.

The short range objective is to place increasing emphasis on new printed fabric styles and designs in publicity and promotion built around the 1951 American Spring Fashion collections. The long range objective is to improve trade practices in design, fabricating, merchandising, and distribution of printed fabrics, both as finished garments and in piece goods.

C. E. Murray, president of the Institute, states that work already has been started on style and fashion publicity by Miss Eleanor Lambert who is retained by the Institute to handle this specialized phase.

Lint Feeds Fire in Weave Room

A recent issue of "Factory Mutual Record" gave an account of a fire which started at a loom and raced along the heavy accumulations of lint on overhead beams and catwalks. Many sprinklers opened before the fire was finally brought under control.

It was pointed out that a frequent cleaning schedule for lint and fly would have kept this fire to small proportions.

Wartime Difficulties—

The Labor Shortage

By RINGGOLD ARDEN

BACK in the September issue TEXTILE INDUSTRIES presented an editorial summary* of some of the expected wartime problems, and since then several thousand copies of reprints of it have been requested from all over the United States. Many of the problems lightly touched upon in that summary are now upon us, or are soon to be upon us in full force, and it is felt that a further and more extended discussion of these wartime problems and difficulties might be helpful.

One of the most immediate problems of the textile industry as the present rearmament program gets under way is going to be labor shortages. These will arise from several immediate causes and a number of subsidiary ones.

The two principal immediate causes will be induction of men into the armed forces, and the competition of government-sponsored war activities for labor. The problem of losing employees to the armed forces will vary in different branches of the industry. Those mills working on defense contracts will possibly be able to get a certain preferred deferment status for employees, though these deferments may not be as logical as a cold, impartial analysis of the war needs might indicate.

Those plants engaged in essential civilian production may also get some deferments for employees. Plants making luxuries, or things which are readily replaceable by staple goods, will get little or no deferment consideration.

This matter of deferments or exemptions will not be handled on a strict basis of reality. Where all sympathetic considerations are discarded, it would be realized that a plant producing absolutely essential war goods is just as important as a battalion, a regiment, or division of soldiers, and deferment from military service of the people working in the plant would be handled accordingly. However, since the draft is handled by local boards, who are influenced by local popular opinion, we will probably see a good bit of what we saw in the last war, when skilled workers were drafted out of textile plants and put in the army, and then the army lent other draftees to the same textile plant. These loaned soldiers were frequently unfamiliar with textile mill work and had to have extensive training. In few cases were they probably as efficient employees as the men they replaced, but the fact that able-bodied men had not been exempted from the draft prevented a great deal of discontent in neighboring communities which had no war plants to afford a basis for exemption.

The various associations of the textile industry could perform a worthy and useful duty by formulating some logical policies on this matter of classifying plants as defense plants, quasi-defense plants, and non-defense plants, and then being willing to fight with the government bureaus involved for the establishment of some recognized rules of procedure in drafting men.

COMPETITION of government-sponsored war plants for labor is going to be a very serious matter in many localities. The recent announcement that the government will build a hydrogen bomb plant in lower South Carolina has drawn to that area a swarm of floating labor, dreaming of the fantastic wages promised. A recent editorial in an Atlanta paper reported that the Labor Department of the United States Government had set up a tentative wage scale and working schedule for that project which would result in paying common labor as high as $97.00 a week, and skilled, or allegedly skilled labor, as high as $270 a week. Another recent newspaper report declared that automobiles from every state in the Union had been checked in Augusta during the past few weeks, and since no work had begun on that project thousands of people were stranded in the neighborhood and either dependent on local charity and government relief, or soon to be dependent.

In the textile industry there is always a fair percentage of this type of labor, which is normally floating labor, and which certainly will desert the textile mills for any such fabulous wages as these.

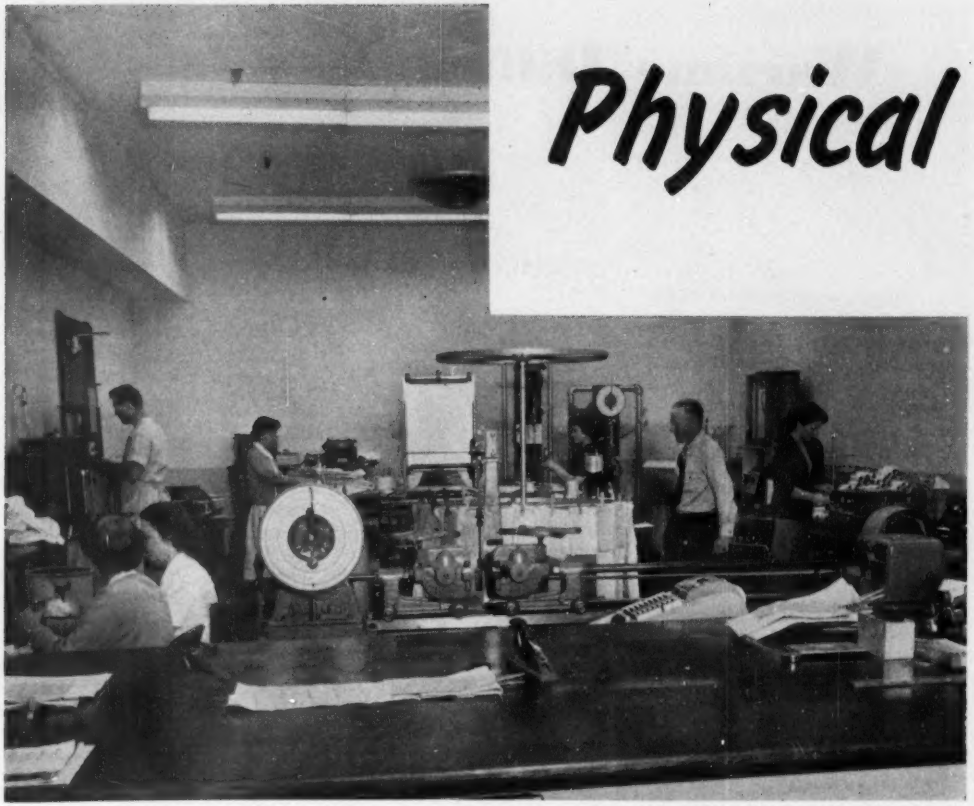
The writer has discussed this particular proposition with a number of textile mill executives in the Augusta area, and they are profoundly alarmed by the probable effect of this project on their working force. Experience in the last war showed that there is no limit to the number of people who can be employed on a government job, and these executives are distressed by the knowledge that this hydrogen bomb project might easily swallow up all of the textile mill help who are disposed to quit their jobs in that area.

Competent estimates during the

(*Continued on page 198*)

* "If History Repeats;" reprints available.

Physical



WEST POINT'S testing laboratory. Author second from left; W. B. Lane, department head, standing at right.

Illustrations by J. Preston Smith of the Testing Department

Introduction

TEXTILE TESTING, as a whole, has only in recent years begun to come into its own. Other industries have been built with the research and routine testing laboratories as a fundamental part of production while the cotton textile industry has continued to use the "rule of thumb" methods handed down over the years.

This condition may be assigned in part to the manner in which the industry developed. In the beginning all the spinning of yarns and weaving of fabrics was done in the home to supply the needs of the family. Here the knowledge of processing was kept in the family for generations and continued even after the advent of the Industrial Revolution when the manufacturing of fabrics moved to factories.

The lack of adequate testing equipment has been partly responsible for this condition. The overall picture has changed rapidly in recent years. The development of testing equipment, the competition offered by the synthetic fibers, the increased demands of quality as well as quantity, along with the insistence by the customer that fabrics be made to rigid specifications have all contributed to the increased interest in machines and methods of testing.

A.S.T.M. Contribution. The textile section of the American Society for Testing Materials has been a vital factor in the growth of textile testing. This section along with the various sub-committees has established methods of testing acceptable to the whole industry. This section has also aided the improvement and development of testing equipment.

Textile testing is the natural result of the buyer's desire to receive the quality that he requires and the manufacturer's concern to deliver a satisfactory product. In order to satisfy these demands, new test instruments have been designed and

For Reprints: *This entire article will be available in pamphlet form. Because of its length, only a limited number of copies will be printed. Readers interested in securing copies for executives, laboratory personnel, technicians, supervisors, sales personnel, etc., may address The Editors, "Textile Industries," 806 Peachtree St., N.E., Atlanta 5, Ga., for information.*

Textile Testing

A Training and Reference Manual

By MARY JO WESSON
Testing Department
Research Division
West Point Manufacturing Co.

EXCLUSIVE

THIS MANUAL is intended primarily as a training manual for new personnel of the Testing Department of the Research Division of the West Point Manufacturing Company. However, it is expected that the manual will be used as a reference by all individuals in the Research Division engaged in physical testing. Thus, the techniques and procedures will become even more standardized and the personal equation reduced to a minimum.

Also, the manual should serve as a reference for production and sales executives who request the testing services and utilize the results sent to them.

A further purpose of this manual is to present the various physical tests made on fibers, yarns, and fabrics in as simple a manner as possible in order that an individual unfamiliar with textile testing may understand something of the nature of these tests. Though many books and articles have been written on textile testing, there are very few that explain the "step by step" techniques of performing the tests. It is hoped that this purpose has been accomplished.

Acknowledgment: The author gratefully acknowledges the cooperation of staff members of the Research Division of West Point Manufacturing Company whose assistance made this manual possible. The author is especially appreciative of the encouragement by the vice-president of the Research Division, M. Earl Heard.

An effort has been made to keep the language of the text as simple as possible with technical terms used only when necessary.

This manual at times draws from "ASTM Standards on Textile Materials," especially when rephrasing of the language would prove misleading.

The manual is not intended to replace publications of American Society for Testing Materials, but to supplement these publications for ease of training and for quick reference; it is hoped that the manual also will be used in clarifying certain testing procedures and aid in their practical application.

Textile testing in the West Point Manufacturing Company is not new. The procedures and techniques described are the result of endeavor of over a quarter of a century. Many persons, organizations, and groups have made their contributions to this development. To them, individually and collectively, this manual is dedicated.

techniques developed. Many of these tests were the direct result of the buyer's desire to make better purchases or to determine whether or not the goods met specification. The manufacturer has accepted these instruments and techniques to better comply with the customer demands. Both parties have benefited greatly by this exchange of ideas.

Three Phases of Testing Program. There are three general phases of every worthwhile testing program: adequate and representative sampling, testing under controlled conditions, and analysis and utilization of the test results.

To be fully aware of the quality of the production in a plant, a sampling plan must be used that will give an accurate picture of the production in all of its various stages. Although all plants have some problems in common, each plant has its own peculiar situation and, therefore, must have its own sampling plan. The chief error of most sampling is the lack of system in taking samples and the meagerness of the samples.

When testing is destructive as in textile testing, it is understandable that testing must be kept to an adequate minimum. By conducting a testing survey (tests at each stage of the manufacturing process) the crucial points of manufacture can be determined. With this information an adequate sampling plan can be used and undue costs eliminated. Even after the crucial points of manufacture have been determined, enough samples must be taken that any change or trend in the process will be revealed. This requires time, study, and expense but the results more than justify the efforts.

Indeed, if the sampling is not ran-

dom and representative, the tests have no meaning or value.

Accuracy in Testing. No sampling plan can in itself control the quality of a manufactured product. The sampling plan may be perfect but if the tests made on the sample are not accurate, the sampling plan might just as well be non-existent. The testing machine must be calibrated periodically. Actual testing techniques must be examined, improved, and human error eliminated.

Tests should, if possible, be made under standard conditions. When this is not feasible, then test results should be corrected to standard conditions.

Absolute honesty in reporting the test results is a prime requirement in any testing program. There can be no place for preconceived ideas or prejudice in the tests or in the analysis of the test results.

Aid to Manufacturer. Adequate sampling, controlled testing, and a complete analysis of the test results will give the manufacturer the complete picture of the quality of his product. The analysis of the test results is more than a casual observation of the test report. An arithmetical average alone can not indicate the quality of the product for it tells nothing of the variation that is present in the individual items.

The average must be accompanied by the measures of dispersion such as the standard deviation, coefficient of variation, etc. Correlations between sets of data must be made. Conclusions must be drawn from a series of tests rather than from one test result. Only after the three phases of a testing program—sampling, testing, and analysis of results—have been utilized, can intelligent decisions be made concerning the quality of a product.

The manufacturer, realizing that quality is built into the product at every stage of processing, has extended the testing program from the raw stock to the finished product. In this type of testing the manufacturer has developed his own instruments and techniques. In some instances production engineers have recognized the possibilities of applying statistical methods to the taking of results.

Quality Control. A simple technique of analyzing test data and plotting these data on charts has been developed and greatly simplifies the control of quality in production. These quality charts have many advantages among which is the knowledge of what has happened in the past, what is happening in the present, and what may be expected of a given process in the future. The control lines or limits tell the production man whether or not the variation present is normal and expected or if some change has taken place in the process which can be traced to a given cause. The time saved by not making unwarranted changes is obvious.

General Laboratory Practice

EVEN THOUGH test specifications and machines are the same throughout the industry, the approach by each laboratory is somewhat different. In our Research Division the procedures described in this manual have been established over a period of time for both speed and accuracy.

In every case accuracy is the foremost quality to be considered. This can not be overly emphasized for at times thousands of dollars are involved in the results of tests.

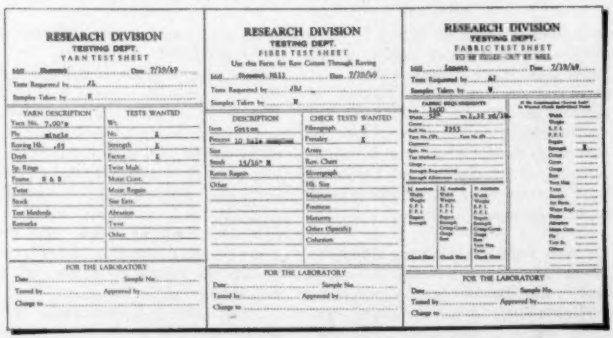
System for Handling Tests. Because the Testing Department handles thousands of tests each year, a system has been developed for receiving and working on the samples. Each sample is accompanied by a sample sheet when it is received by the Testing Department. The various types of sample sheets may be seen in Fig. 1.

There are different colors for the different types of sheets. The fabric test sheet is yellow, the yarn test sheet is pink, and the fiber test sheet is blue. These sheets are filled in completely by the mill requesting the test except for the bottom portion of the sheet entitled "For The Laboratory." This part is filled in by the individual receiving the samples.

When a sample is received, it is entered immediately in the sample log book and given a sample number. The entry on the sample log book shows the sample number, the date received, the description of the sample, and the tests required. A space is left on the sample log book for the recording of the cost of the test.

After the sample has been properly entered, it is turned over to the person or persons who make the neces-

Fig. 1. Forms used by Research Division for recording test data on samples received for testing. Each sheet is a different color.



sary tests. On completion of the tests, the analysis sheet is returned to the receiving desk where necessary calculations are made.

A typewritten report is made of all tests.

Checked for Accuracy and Specification. Before performing the necessary tests, analysis sheets are prepared. This involves a certain amount of what seems to be only clerical work. The writing up of the various test sheets has its purpose. The individuals making the tests become more familiar with the various types of fabrics, the various customers, and their particular test methods.

While the test is being made, the results are checked not only for their correctness but also as to whether or not they meet specification. This procedure also eliminates the necessity of having one employee do nothing except write up test sheets.

It is the policy of some laboratories never to let the technicians see the requirements for a test. Some laboratories even prohibit the making of calculations by the technicians. It is the policy of our laboratory to encourage the technicians to make their test reports as complete as possible. The aim of this procedure is to relieve the monotony of routine work and to allow the technician to learn as much as possible of the various phases of the work.

There is danger of the individual allowing the requirements to bias his results. However, the personnel of the Testing Department are trained to know the following: the test result as such is not important; only the correctness of a test result is important. If a test result should meet the requirement and is correct, everyone is pleased. If a test result should not meet the requirement and is correct, the responsibility of the technician is ended. *It is not a part of his job to be concerned over whether or not a test result meets the specification but only if a test result is correct.* With this approach it doesn't matter if the technician knows the requirement.

Because the writing up of the test sheets is considered as a part of routine performance of tests, the description of this procedure will be found under the various analyses.

The calibration of the various testing machines is highly important, and a separate section is devoted to this subject. The reason for the calibrating of machines is obvious, and it will suffice to say here that it is a practice of this laboratory to calibrate the testing equipment periodically.

About the Author

THE AUTHOR of this manual, Miss Mary Jo Wesson, was born in Tallapoosa County, Alabama, somewhere around the '20s. After going to Lanett (Ala.) High School, she worked her way through Alabama College at Montevallo where she majored in physical science and mathematics.

Following two years of teaching in high school, she was with DuPont in the ballistics lab of the Alabama Ordnance Works; there she calculated projectile speeds, tested powder, and performed other duties in which her math and physics training were found useful.

In 1943 she joined the Testing Department of the Research Division of West Point Manufacturing Company.

Despite her ability to fathom calculus and discuss statistical formulas as if both were grammar school coursea, she likes to dance, read, and "try to write." Sports and Little Theater are some of her after-work activities.

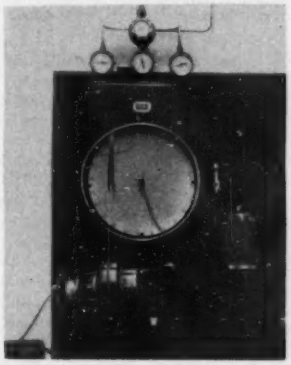
She is of a textile family and of "The Valley." Two brothers and her mother are employed at the Lanett Mill.

Miss Wesson

Testing Conditions. Unless otherwise specified, all tests are made after the sample has been conditioned for a minimum of 4 hours at 70 degrees Fahrenheit, 65% relative humidity. These are standard testing conditions throughout the industry for cotton fabrics.

Rayon fabrics (filament rayon) are preheated for 1½ hours at 140 degrees Fahrenheit and conditioned for 12 hours under standard testing conditions.

Fig. 2. Control panel for testing room air conditioning equipment.



All fabrics should approach the standard testing conditions from the dry side. By this is meant the moisture of the sample before conditioning should be less than the moisture of the sample after being conditioned. A preconditioning room is necessary to always be certain that the foregoing condition is met. By leaving the samples in a dry atmosphere their moisture will be driven off and the sample will be "on the dry side."

The testing room of the Research Division is maintained at standard testing conditions (70 deg. F., 65% R. H.) twenty-four hours a day, seven days a week. The control panel shown in Fig. 2 was manufactured by the Taylor Instrument Company and maintains standard conditions as set by the American Society for Testing Materials in their Standards on Textile Materials under their designation D 39-49. The conditioning equipment is a Parks-Cramer unit.

The following pages will give in detail the various tests under their proper heading—fabric, yarn, and fiber analysis. Although it is possible to describe testing techniques, these techniques can best be learned from an experienced operator. Written instructions at best are only a corollary to verbal instruction.

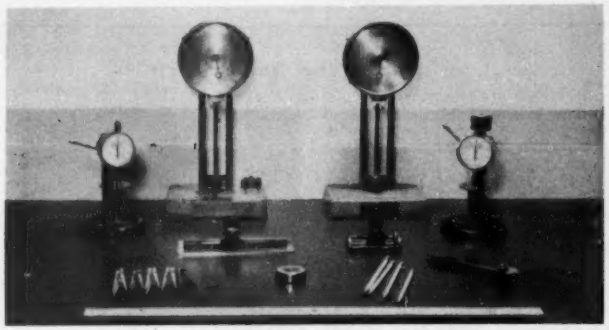


Fig. 3. The tools needed for fabric analysis.

Fabric Analysis

Tools and Routine

The usual fabric tests requested in routine testing are full analysis, ¾ analysis, ¼ analysis, weight, and strength tests. However, there are times when certain individual tests are requested, and these are marked on the sample sheet. In any case, the sample sheet is checked for the tests required and should be read carefully by the person making the analysis.

The tools necessary for fabric analysis are as follows (See Fig. 3):

24" ruler
scissors
pick counter
gauge
measuring tape
crimp tester
pencils
clothes pins (for attaching samples to analysis sheet)

The procedure of fabric analysis (except strength tests, square weights, and regains) is usually referred to in the Testing Department as "cutting out." The term is a descriptive one as will be seen later.

The various tests will be described in the order in which they should be made. The procedures described have been developed over a period of years as the easiest, most logical method to use.

The sample to be analyzed will have attached to it the sample sheet giving the sample number, the mill making the fabric, the customer with the customer's specification, the style and roll number, and the tests required. With this information and the test record book for the particular mill in question, the analysis sheet is filled out in regard to requirements and allowances or tolerances (see Fig. 4).

Note: All general fabric tests and machine specifications may be found in the A. S. T. M. Standards on Textile Materials under their designations D 39-49 and D 76-49, respectively. Any deviation will be noted in the text.

By using the test record book, time is saved by not consulting the original specifications. Of course it is sometimes necessary to consult the original specification which may be found in the testing room files. All test results are reported under the heading "Test" on the analysis sheet. A weight and strength test is reported on the sample sheet and the typewritten report is made directly from the sample sheet.

Air Permeability Test

This test is designed to measure the rate of flow of air through a fabric. There are two methods by which this may be determined: The Frazier Air

Fig. 4. Typical fabric analysis sheet.

Research Division of the West Point Manufacturing Company

Our Sample No. _____ Shawmut, Ala.,
Test and Analysis of Style----
Method of Test Name of Customer and type of test such as ASTM Grab
Condition of Test 70 deg. F., 65% relative humidity for minimum of 4 hours

TEST	REQUIREMENTS	ALLOWANCE
Width	60"	59.80 to 60.80"
Weight Basis	19.40 oz.	18.92 to 19.92 oz.
Warp Ends per Inch	32	31.30 to 32.70
Picks per Inch	28	26.90 to 29.10
Warp Yarn Count (Size)		
Fill. Yarn Count (Size)		
Contraction Warp	16%	14.40 to 17.60%
Contraction Fill.	9%	7.20 to 10.80%
Off Square		
Gauge	.031"	.0295 to .0325"
Bow	1.25" Max	
Warp Twist Ply		
Fill. Twist Ply		
Moist. Cont.		
Regain		
Tensile Strength Roll # ---	Warp Fill.	Warp Min. 151 Fill. 151 Warp Fill.

Machine:

Style ----- Spec. and Code # written here after the style Mill Name of mill producing fabric

Permeameter* and the Densometer methods.

Frazier Air Permeability Test:

Machine: Frazier Air Permeameter manufactured by the S. W. Frazier Company, Washington, D. C.

Capacity: 1 to 700 cubic feet of air per minute per square foot of fabric. Nine different orifices.

Calibration: Before each series of tests the machine calibration is checked with No. 3 orifice giving a reading of 5.8 on the vertical manometer. Calibration is done by the Research Division.

The description of the test and machine requirements will be found in the A. S. T. M. Standards on Textile Materials under the designation D 737-46. The instrument during test is shown in Fig. 5.

The orifice over which the fabric is placed is mounted in the top of a table. The clamp for holding the fabric against the orifice is pivoted in its supporting frame so that it will press uniformly against the upper surface of the orifice. The frame is hinged at the back of the table and locks at the front. It can be raised to permit cloth to be drawn across the orifice. The speed of the motor which draws air through the area of fabric under test is adjusted by a voltage regulator.

Manometers filled with a special oil furnished with the instrument are used to indicate the pressure drops across the fabric under test and across the orifice for measuring the air flow. The amount of air flowing through a fabric under test is determined from the pressure drop indicated by the vertical manometer and the calibration of the orifice which is used.

The inclined manometer is always adjusted to read 0.5 inches of water pressure. A set of nine orifices covers the range of air permeability from 1 to 700 cubic feet of air per minute per square foot of fabric. The orifices are easily inserted through a door opening into Chamber B (see Fig. 6). The selection of orifices is a process of elimination, and the orifice selected must give a reading on the vertical manometer between 3.00 and 14.00 with 0.5 inches of water pressure.

To perform a test, unfold the sample so that only one thickness is used; place the fabric over the orifice mounted in the table top; place the beveled ring over the fabric to hold the fabric in place; secure the clamp; with the voltage regulator adjust the inclined manometer to read 0.5 inches of water pressure and take the reading of the vertical manometer.

Five different readings are made using a different section of the sample each time. The air permeability is read directly from tables prepared for each orifice.

Fig. 5. Photo of the Frazier Air Permeameter during a test.

Gurley Densometer Test:

This method is an alternate method of determining the rate of flow of air through a fabric and is usually called a "porosity test."

Machine: Densometer manufactured by W. and L. E. Gurley, Troy, New York.

Capacity: 0 to 350 cubic centimeters in 50 cc intervals 1/10 and 1 sq. in. area orifices.

The Gurley Densometer (see Fig. 7) consists of an outer cylinder which is partly filled with oil to act as an air seal, and an inverted inner cylinder having a closed top which weighs 5 oz and is graduated in cubic centimeters. Air under light pressure equal to 1.22 inches of water pressure is supplied by the weight of the inner cylinder to the sample which is held between clamping plates having a circular orifice of either 1/10 or 1 sq. in. area. The upper plate is attached to the outlet of an air tube which extends above the surface of the oil. A gasket, attached to the clamping surface of the top plate, seals off the surface of the sample against side leakage of air. The lower plate which rests on a self-aligning central pin is raised by a capstan screw to clamp the sample.

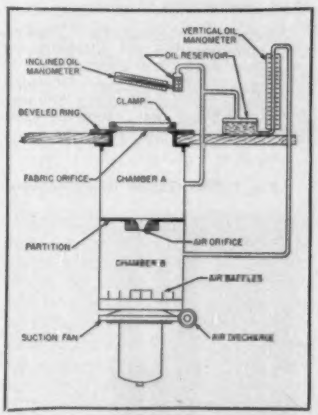


Fig. 6. Diagram of the Frazier Permeameter, showing principle of operation.

To make a test, raise the inner cylinder of the Densometer until it is supported by the catch; clamp the sample; lower the inner cylinder until it floats in the oil; with a stopwatch measure the time in seconds for 300 cubic centimeters of air to pass through the exposed areas of the sample. The average of five tests

*Mention of manufacturer by name designates machines in West Point laboratory at the time the manual was written; omission of other manufacturers' names does not necessarily indicate that no other equipment is available.

TABLE FOR SELECTION OF THE PROPER DEPTH OF WATER

Army ducks, numbered ducks, and tent twill:

over 22 oz	Depth of water	20 inches
15-22 oz	Depth of water	16 inches
13-15 oz	Depth of water	12 inches
9.73-13 oz	Depth of water	8 inches

For numbered ducks, the following table has been prepared according to the number:

No. 2 and No. 4 duck	Depth of water	20 inches
No. 5, No. 6, and No. 7 duck	Depth of water	16 inches
No. 10 duck	Depth of water	12 inches
No. 12 duck	Depth of water	8 inches

is reported as the number of seconds per 300 cc of air.

Water Resistance of Fabrics

The water resistance of fabrics may be defined simply as the resistance by the fabric to the flow of water through the fabric by capillary action or by passing through the air spaces between the ends and picks or a combination of both.

Machine: Hydrostatic Tester—manufactured by Alfred Suter, New York, New York.

Water Permeability Tester—made by the Research Division, West Point Manufacturing Company, Shawmut, Alabama.

Capacity: Depths of water up to 58 inches on the Suter machine and up to 26 inches on the Research machine.

There are two methods used by the Testing Department to test the water resistance of fabrics. These are the water permeability and hydrostatic tests. Both of these tests fall in the category of the hydrostatic method but are so distinguished in this laboratory. Both tests may be run on the Suter tester, but only the water permeability test may be run on the tester made by the Research Division. The various tests for resistance on fabrics to water are described by A. S. T. M. in their Standards on Textile Materials under the designation D 583-5OT. The Hydrostatic machine is shown in Fig. 7A.

The tester is equipped with a reservoir which maintains an adjustable head of water having a temperature of 70 F ± 2 degrees. The specimen to be tested forms the bottom of the reservoir. The inside diameter is 11.4 ± 0.25 centimeters. The test specimen is cut approximately 12 inches square.

Water Permeabilty Test

To perform a test, place the specimen under the clamp smoothly but without tension: raise the head to the proper height (see accompanying table); remove the clamp from the supply tube and allow the water to flow on the fabric for ten minutes;

Fig. 7. The Gurley Densometer.

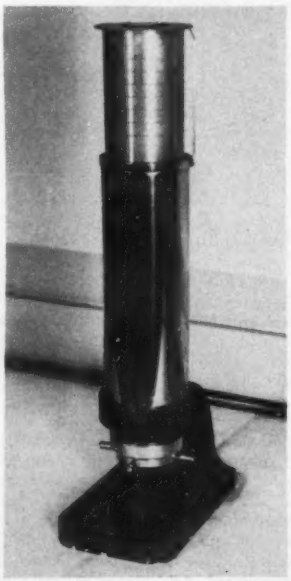
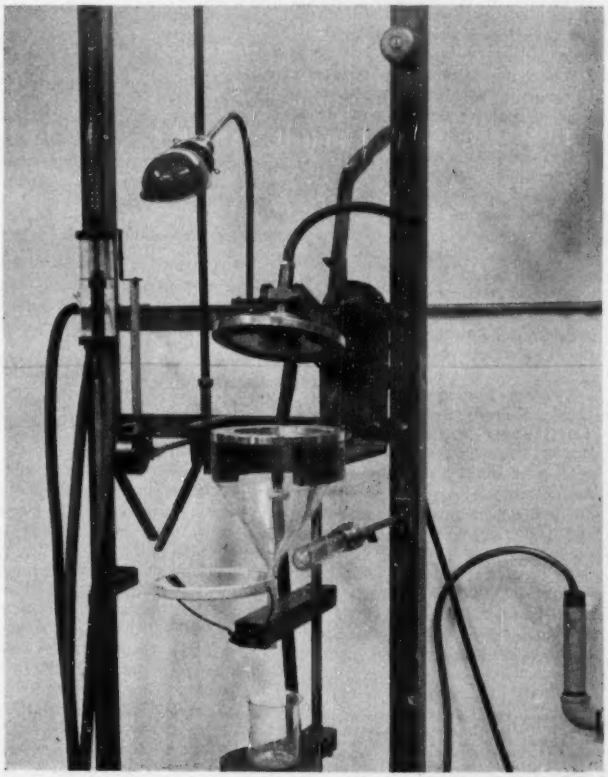


Fig. 7A. The Suter Hydrostatic Tester.



remove the beaker from underneath the funnel and measure the collected water in a graduated cylinder to the nearest cubic centimeter. An average of 4 tests is reported as the water permeability of the fabric.

Hydrostatic Test

To perform a test, clamp the specimen smoothly but without tension; start a steady flow of water from the reservoir; with the lever control cause the depth of the water to be increased at the rate of 2 centimeters per second; when the third drop has penetrated through the fabric, read the head of water in centimeters.

The average of five tests is reported. The reading may be made in inches if the specification requires it. There is a mirror arrangement by which the operator may watch for the formation of the drops of water on the bottom of the specimen.

In both of the tests, care should be taken that the water from the tests run previously does not enter into the calculation of the results. Especially is this true of the water permeability test. In measuring the volume of water in the graduated cylinder, the bottom of the miniscus is read.

Width

The width of a fabric is the perpendicular distance from selvage to selvage expressed in inches. The width is measured with the fabric laid out smoothly on the cutting out table but without tension in either direction.

The average of at least five different measurements uniformly distributed along the sample is reported as the width of a fabric. The width is measured to the nearest 1/16 inch and the measuring tape *must* be perpendicular to the selvages.

Bow

The bow of a fabric is the deviation the filling threads make from an imaginary line drawn perpendicular to the selvages of the fabric. The bow is determined in the following manner: with the fabric lying smoothly on the table without tension, the position of the filling yarn is marked with a line drawn on the fabric across the full width and following the filling. The straight edge is placed across the fabric just touching the ends of the filling line. A small line is drawn at the greatest distance between the straight edge and the filling line. This distance is measured to the nearest 1/16 inch.

To express the bow as a percentage of the width of the fabric, the following equation is used:

$$\text{Bow, per cent} = \frac{d}{w} \times 100\%$$

Where:

d = greatest distance in inches between the marked filling yarn and the straight edge, and

w = width of the fabric in inches.

Example: What is the percentage bow of a fabric 42" in width with a bow of ½"?

Answer: Bow, per cent = $\frac{.50}{42} \times 100\% = 1.19\%$

Gauge

The gauge of a fabric is the thickness of the fabric expressed in thousandths of an inch.

Machine: Gauge manufactured by Randall & Stickney, Waltham, Mass.

Capacity: 0 to 0.5 inches—0.001 inch intervals. Diameter of presser foot—⅜ inches.

Calibration: Research Division by use of Starrett thickness gauges.

To perform the test, place the fabric on the anvil of the gauge smoothly but without tension; lower the presser foot on the fabric gradually (without impact); allow the presser foot to rest on the fabric at least 10 seconds and observe the reading. At least five readings are taken across the width of the fabric and the highest, lowest, and the average of the highest and lowest reported. Thus:

Gauge	.040"	.042"	.041"

This technique may be observed in Fig. 8. A special gauge having a presser foot width of ½ inch is used on some of B. F. Goodrich Company's fabrics in compliance with their Test Specification No. 105.

Count

The count of a fabric is the number of warp ends or filling picks in one inch of the fabric.

Machine: Micrometers manufactured by Chas. Lowinson, New York, N. Y., and Alfred Suter, New York, N. Y.

Capacity: Three scales—1 inch, 6 picas, and 30 mm. Each scale is subdivided into ¼ inches, 1 pica, and 1 mm., resp. The Alfred Suter micrometer has a 3-inch scale subdivided into ¼ inches.

Warp Count

The actual number of ends (warp yarns) in one inch is counted at five places in the fabric and the average of the five counts reported. No two spaces counted should include the same yarns. If there are fewer than 25 ends per inch, the ends in 3 inches are counted at five different places and the average ends per inch reported. No count shall be made nearer the selvage than one-tenth the

Fig. 8. Testing the thickness of a fabric with a Randall & Stickney gauge.

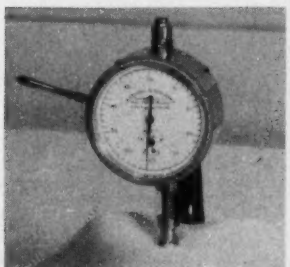
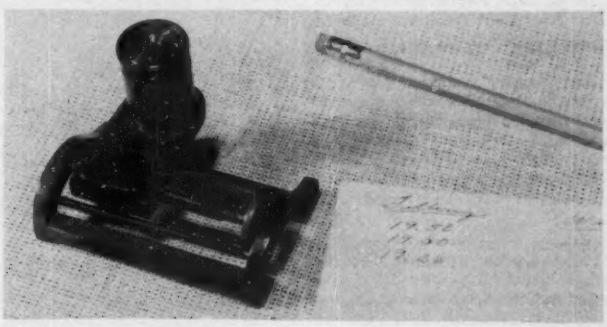


Fig. 9. Pick counter of the micrometer type.



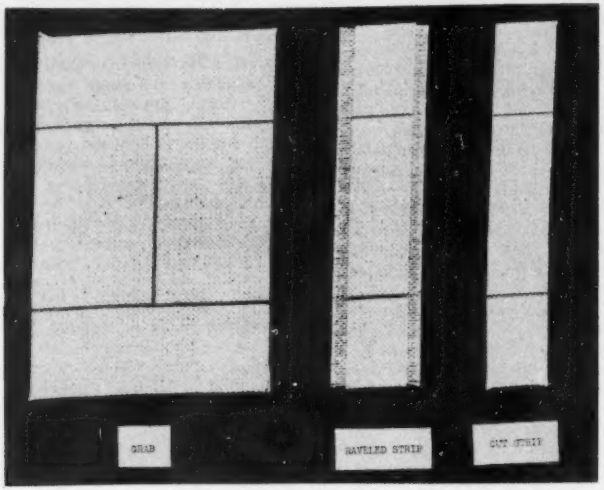


Fig. 10. Specimens prepared for the three types of A.S.T.M. strength tests. Left to right: Grab; Raveled-Strip; and Cut-Strip.

width of the fabric. The micrometer or "pick counter" used for this test is shown in Fig. 9.

The count is usually made by counting the even number of ends (2, 4, 6, 8, etc.) and thus the beginning mark is placed on a "down" end or one that is under the filling yarn. To insure accuracy, the counter is placed so that the scale runs parallel to the pick. If the weave of the fabric is not a plain weave or has a very high count, it is sometimes impossible to use the counter. In such a case a swatch of fabric 1¼ inches is cut and raveled to exactly one inch. Each end is pulled out and counted in groups of ten.

Filling Count

The picks per inch are determined in the same manner as the warp ends per inch.

Breaking Strength

The breaking strength of a fabric is the ability of the fabric to resist rupture when tested under specified conditions.

Machine: Horizontal Tester—Model Q; Vertical Tester—Model J-2. Manufactured by Scott Testers, Inc., Providence, R. I.

Capacity: 400-800 lb, Model Q; 600-1500 lb, Model Q; 250-500 lb, Model J-2.

Calibration: Scott Testers, Inc., every 3 years. All machines calibrated by the Research Division every 3 months.

There are three types of A.S.T.M. methods of determining the breaking strength of fabrics—grab, raveled-strip, and cut-strip. Of these three, the grab test is the one most used. Certain customers have a special method for breaking strength determination that will be designated in the specification. These special methods differ from the regular methods usually in distance between jaws, in the width of the specimen, in the width of the jaw itself, or any combination of the three.

The three types of A.S.T.M. breaks are shown in Fig. 10.

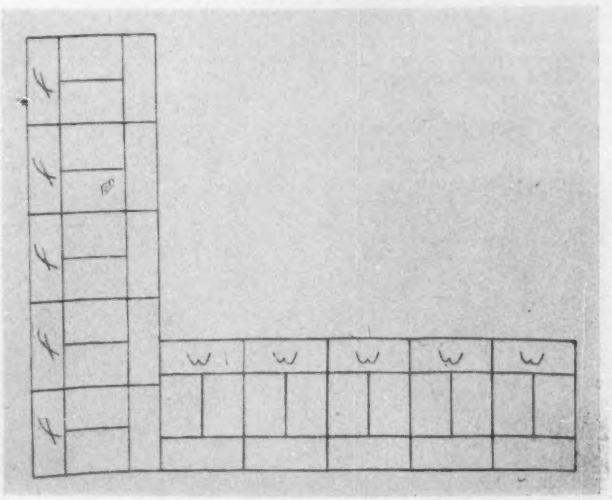
Grab Method

Breaking strength is determined by the grab method unless another method is specified. The specimens for test are 4 inches in width and 6 inches in length with a 3-inch distance between jaws. Two sets of five specimens are required: one set for warp breaking strength having the longer dimension parallel to the warp yarns, and the other set for filling breaking strength having the longer dimension parallel to the filling yarns.

No two specimens for warp breaking strength shall contain the same warp yarns, or for filling strength the same filling yarns. Unless otherwise specified, specimens are not taken nearer the selvage than one-tenth the width of the fabric. These breaks are drawn on the fabric as one unit 20 inches in length and 6 inches in width with five subdivisions 4 inches wide. The 3-inch distance between jaws is marked on the breaks and 1½ inches inside the width. In the center of each specimen a line is drawn across the specimen parallel to the long side to insure proper alignment of the specimen in the jaws of the testing machine.

The procedure is more easily illus-

Fig. 11. Method for drawing the A.S.T.M. grab test on the fabric. Letters designate warp and filling.



trated than described for the beginner and can be seen in Fig. 11. The separating speed of the jaws is 12 inches per minute.

Raveled-Strip Method

This test is made in accordance with the direction for the grab method with the following exceptions: the specimens are 1½ inches in width and each specimen is raveled to 1 inch in width by taking from each side approximately the same number of yarns. This test may be observed in Fig. 12.

Cut-Strip Method

This test is made in accordance with the directions for the raveled-strip method with the exception that the specimens are cut 1 inch in width. The cut-strip method is applicable to heavily sized or coated fabrics which can not be tested by the raveled-strip method. The cut-strip method is seldom used by the Testing Department as the fabrics made by the West Point Manufacturing Company do not fall in this category.

Behr-Manning Method

The raveled-strip method used by Behr-Manning is made in accordance with the A.S.T.M. method with the following exceptions: the distance between the jaws is 5 inches; the length of the specimen is 8 inches; the width of the warp specimens is 1¼ inches for a warp count of 46 and over and 1½ inches for a warp count under 46; the filling test specimens are always 1½ inches in width.

Imperial Belting Company Method

The cut-strip method is used by the Imperial Belting Company and differs from the regular A.S.T.M. cut-strip method only in dimensions and distance between jaws. The dimensions are 2 x 6 inches in length with 3¼ inches between jaws. The jaws used in the testing machine are as follows:

Type of Break	Top Jaw
Grab	1 x 1 in.
Strip	1 x 2 in.

The dimensions of the bottom jaw are always 1 x 2 inches or more. The longer dimension of the jaw is perpendicular to the load.

Procedure of Testing

The specimen is placed symmetrically in the clamps of the machine with the longer dimension parallel to and the shorter dimension at right angles to the direction of application of the load, care being taken to grip the same yarns in both clamps. Should the same yarns not be caught in both clamps a shearing action will result and a lower strength will be shown on the dial.

The average of the results of the five individual tests on the warp is reported as the warp breaking strength, and the average of the five individual tests on the filling is reported as the filling breaking strength. If for any reason a result falls markedly below the average and is attributable to faulty operation, the result is discarded and a new specimen taken and included in the average.

A specimen properly placed in the machine is shown in Fig. 13.

It might be stated here that the procedure in our laboratory is to attach the specimens for breaking strength together with the squares for the weight test to the analysis sheet to be hung on the conditioning rack for 4 hours. The breaking strength and weight are the chief tests to be conditioned and, thus, space is saved by not hanging the entire sample.

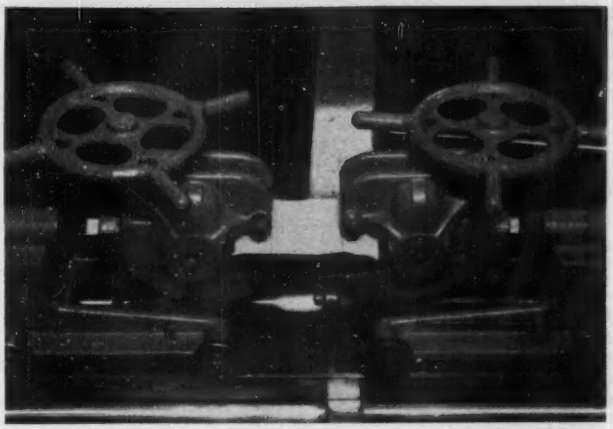
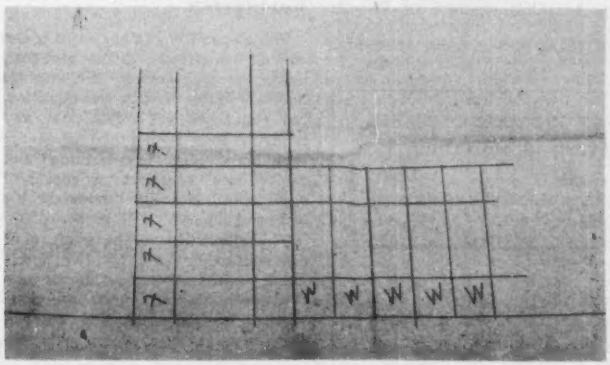


Fig. 13. A.S.T.M. grab specimen properly placed in testing machine.

Fig. 12. Method for drawing the A.S.T.M. raveled-strip test on a piece of fabric. Letters indicate warp and filling.



Strength Correction: Cotton

There are times when it is desirable to correct the strength of a fabric at a certain regain to another regain. Some customers require that strength tests always be corrected to a specified regain. This procedure has the feature that fabrics which have been tested at different regains can, after being corrected to a specified regain, be compared. This meth-

od is also useful for laboratories which do not test under standard conditions.

The general equation for correcting strength results is as follows:

$$\text{Corrected Strength} = \frac{\text{Actual Strength} \times (100 + (r \times R))}{100 + (r \times A)}$$

Where

r = rate of increase or decrease of strength for 1 per cent variation in moisture regain
R = Specified Regain
A = Actual Regain

The rate of increase or decrease of strength for 1 per cent variation in moisture may be determined generally from the accompanying table taken from page 350 of the 1941 edition of George B. Haven's *Handbook of Industrial Fabrics* published by the Wellington Sears Company.

Various fabrics may differ in their strength increase or decrease from the foregoing table but the difference will be slight. The different customers have established their own equations, and these equations will be found in their specifications.

Example: What would be the corrected strength at 6.50% moisture regain of a fabric weighing 12 oz/sq yd whose actual breaking strength at 7.50% moisture regain is 160 lb in the warp and 155 lb in the filling?

Warp:

$$\text{Corrected Strength} = \frac{160 \times (100 + (7.00 \times 6.50))}{100 + (7.00 \times 7.50)}$$

$$\text{Corrected Strength} = \frac{160 \times 145.5}{152.5} = 153 \text{ lb}$$

Filling:

$$\text{Corrected Strength} = \frac{155 \times (100 + (7.00 \times 6.50))}{100 + (7.00 \times 7.50)}$$

$$\text{Corrected Strength} = \frac{155 \times 145.5}{152.5} = 148 \text{ lb}$$

Strength Correction: Rayon

The method of correcting rayon fabric strengths used by the Research Division is based on the work of H. R. Bellison on "Viscose Rayon: Stress-Strain Properties III—The Effect of Relative Humidity." This report will be found in *Textile Research*, Vol. 10, pages 372-379.

This method differs from the cotton method of strength correcting in that the strength of the fabric is corrected from one relative humidity to another at a constant temperature (70 F) instead of working with the regain. This eliminates the necessity of making a moisture determination since the relative humidity of the testing room is constant—65%. This method is applicable within the range of relative humidity of 43-79%.

Rayon has the property of becoming weaker as moisture is absorbed and stronger as moisture is lost. For each 1 per cent decrease in relative humidity there is a 1.045 per cent increase in strength. For each 1 per cent increase in relative humidity there is a 0.79 per cent decrease in strength. By knowing these two values it is a simple matter to make strength corrections.

Example: A rayon fabric has a warp breaking strength of 559 lb and a filling breaking strength of 488 lb at 70 F, 65% relative humidity. What will be the breaking strength at 70 F, 55% relative humidity?

65%-55% = 10% decrease in relative humidity
1.045% × 10% = 10.45% increase in strength for a 10% decrease in relative humidity
Warp: 559 × 110.45 = 617 lb at 70 F, 55% relative humidity
Fill: 488 × 110.45 = 539 lb at 70 F, 55% relative humidity

Example: A rayon fabric has a warp breaking strength of 400 lb and a filling breaking strength of 350 lb at 70 F, 55% relative humidity. What will be its breaking strength at 70 F, 65% relative humidity?

65%-55% = 10% increase in relative humidity
0.79% × 10% = 7.90% decrease in strength for a 10% increase in relative humidity
Warp: 400 × 92.10 = 368 lb at 70 F, 65% relative humidity
Fill: 350 × 92.10 = 322 lb at 70 F, 65% relative humidity

Rayon Weight Correction

When rayon fabric is tested under standard conditions for cotton fabrics it is sometimes desirable to correct the weight to the standard regain of 11 per cent. To do this use the following equation:

$$\text{Corrected Weight} = \frac{W \times (100\% + 11\%)}{100\% + R} \times 99.1\%$$

Where

W = weight of the fabric at 70 F, 65% relative humidity
R = actual regain at 70 F, 65% relative humidity

The first portion of the equation will be recognized as a general correction equation. The second portion —99.1%—was derived from the relationship of 9.90% moisture content to 11% moisture regain. In other words, 9.90% moisture content is 0.9% of 11% moisture regain. In order to subtract the amount from the weight calculated by using regains, multiply by 99.1% (100% — 0.9%).

Example: A rayon fabric weighs 6.32 oz/sq yd and has a regain of 13.55%. What will be its weight at 11% regain?

$$\text{Corrected Weight} = \frac{6.32 \times (100 + 11\%)}{100\% + 13.55\%} \times 99.1\%$$

$$\text{Corrected Weight} = \frac{701.52}{113.55} \times 99.1 = 6.18 \times 99.1$$

Corrected Weight = 6.12 oz/sq yd

TABLE FOR DETERMINING RATE OF INCREASE/DECREASE IN STRENGTH FOR 1% VARIATION IN MOISTURE

Group	Weight in ounces per square yard	Rate of increase or decrease in strength for each 1% change of moisture
I	1.5- 4	4.00
II	4 -10	5.00
III	10 -18	7.00
IV	18 -48	10.00

Elongation

The elongation of a specimen is the amount of stretch of the specimen under stress based on the original length. Unless otherwise specified, the elongation of a fabric at any breaking load is obtained when the breaking strength is determined and for the same specimens by means of a suitable recording device on the testing machine.

The elongation is the average of the results obtained for five specimens, and it is expressed as the percentage increase in length. The elongation is calculated from the start of the line as shown on the graphic rec-

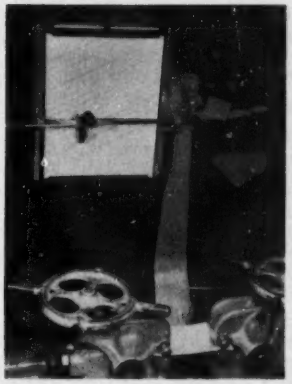


Fig. 14. Making an elongation test.

ord. The autographic attachment is shown during test in Fig. 14.

The elongation of a fabric made on a graphic recording attachment is read in the following manner:

1. With a hard lead pencil mark the point of departure from the vertical line.
2. With a ruler measure the exact distance of this point from the base line.
3. Under the point of rupture mark this distance (determined in Step 2) from the base line.
4. Draw a line through this point which is exactly parallel to the base line. This must be done carefully as an error of even 1/32 of an inch will make a difference in the result.
5. Determine the point of rupture of each break (the point where each line begins a vertical ascent) and measure in 1/32 of an inch the distance from the point of rupture to the line drawn parallel to the base line.
6. Calculate the per cent elongation as follows:

$$\frac{\text{Total of 5 readings}}{3 \times 5 \times 32} \times 100\% = \text{Per cent elongation}$$

or

$$\frac{\text{Total of 5 readings}}{480} \times 100\% = \text{Per cent elongation}$$

In the denominator of the first equation the 3 refers to the distance between jaws, the 5 to the number of readings, and the 32 to the fraction of an inch in which the readings are made. Some customers require that their elongation charts be figured in a slightly different way from the foregoing procedure. These methods will be found in the general test specification of the customer.

Tearing Strength

The tear strength of a fabric is the force required to start or continue a tear under specified conditions. There are two methods in general use—the trapezoid method and the tongue method.

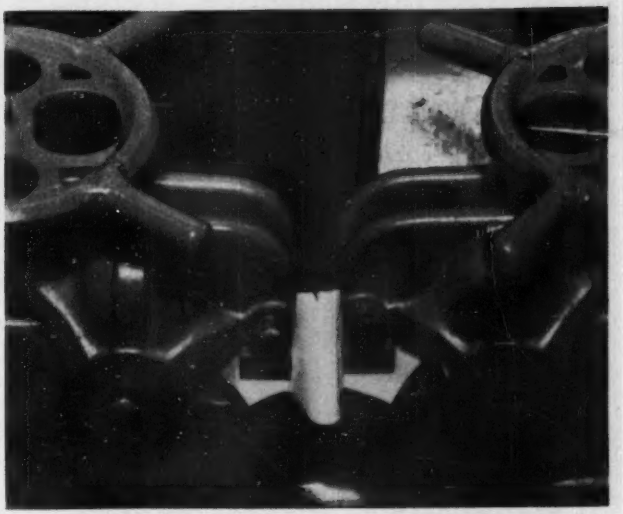


Fig. 15. Trapezoid method for determining tear strength of a fabric. Specimen is properly placed in the testing machine.

Trapezoid Method

The test specimens are 3 inches in width and 6 inches in length. Two sets of five specimens are required, one set for warp tearing strength having the longer dimension parallel to the warp yarns; and the other set for filling tearing strength, having the longer dimension parallel to the filling yarns.

An isosceles trapezoid having an altitude of 3 inches and bases 1 and 4 inches in length is marked on each specimen, preferably with the aid of a template. A cut ¼ to ⅜ inches in length is made in the center of the 1 inch base and perpendicular to it.

The testing machine used is the same as that used for the grab method of breaking strength with the following modifications: the faces of the clamps measure 1 x 3 inches or more and the distance between the jaws is 1 inch at the beginning of the test. The specimen is clamped in the machine along the non-parallel sides of the trapezoid so that the cut is halfway between the clamps, the short edge is held taut, the long edge lying in folds. The load necessary for tearing the fabric is observed and the average of the five specimens (warp and filling) reported as the tearing strength. The tear specimen properly placed in the machine is shown in Fig. 15.

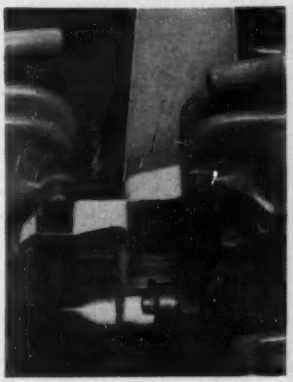


Fig. 16. Tongue method for determining tear strength of fabric. Note way specimen is placed in machine.

Tongue Method

The test specimens are 3 inches in width and at least 8 inches in length. Two sets of five specimens each are required: one set for warp tearing strength, having the longer dimension parallel to the filling yarns; and the other set for filling tearing strength, having the longer dimension parallel to the warp yarns. A longitudinal cut 3 inches in length is made lengthwise

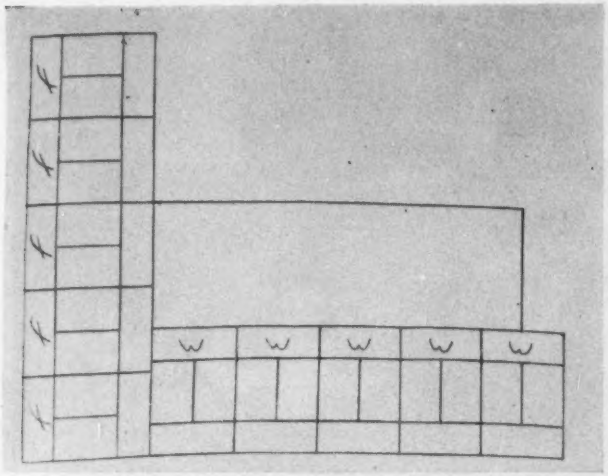


Fig. 17. Method for drawing squares on a sample of fabric preparatory to conducting a weight test. Letters designate warp and filling.

of the specimen, starting in the center of one end.

The testing machine conforms to the requirements for the grab method of breaking strength. The specimen is placed in the machine with one of the tongues in each clamp. The average load necessary to tear the fabric is reported. The averages of five individual tests are reported as the tearing strength of the fabric—warp and filling.

The tear specimen properly placed in the machine is shown in Fig. 16. The tongue method is used by the manufacturers of coated fabrics to determine the tearing strength.

On all tearing strength tests the pawls of the testing machine are disengaged during the test.

Weight

The weight of a fabric is expressed in one of the following ways: ounces per linear yard, ounces to a given width, or in yards per pound. Three squares having a dimension of 6 x 6 inches are drawn on the fabric just above and parallel to the warp breaks. These squares are usually drawn together in a unit of 6 x 18 inches in length as shown in Fig. 17. Of course, the square may be taken at any place on the sample provided the space selected is not within 10 per cent of the width of the fabric. However, the easier method is to take the squares as shown in Fig. 17.

These squares are weighed in grains and this weight converted to ounces for a given width. This width is usually called "weight basis." This method of conversion is described here. However, the person doing the actual cutting out need not, as a rule, concern himself about the conversion. One person in the laboratory does the calculations on the analysis sheet which are easier to perform on a calculator. The person cutting out simply places the squares on top of the breaking strength tests and attaches them to the analysis sheet prior to placing the sample on the conditioning rack.

It might also be stated that the squares are cut from the fabric as a unit of 6 x 18 inches and weighed only once.

The average weight of three 6-inch squares multiplied by a constant for the given weight basis will give the ounces the fabric weighs to that width. The constants for the various

TABLE FOR CALCULATING WEIGHT PER WIDTH OF CLOTH FROM SAMPLE

Width	6 x 6" Constant	6 x 18" Constant
22"	.0503	.016762
24"	.0548	.018285
25"	.0571	.019047
28"	.0639	.021333
28 1/8"	.0651	.021714
29"	.0662	.022095
29 1/8"	.0674	.022476
30"	.0686	.022857
30 1/8"	.0697	.023238
31"	.0709	.023619
31 1/8"	.0720	.024000
32"	.0732	.024381
32 1/8"	.0743	.024762
34"	.0777	.025948
34 1/8"	.0789	.026286
35"	.0800	.026667
36"	.0823	.027428
37"	.0846	.028190
37 1/8"	.0857	.028571
38"	.0868	.028952
39"	.0891	.029714
40"	.0914	.030476
41"	.0937	.031238
42"	.0960	.032000
43"	.0982	.032762
44"	.1005	.033524
45"	.1028	.034286
46"	.1051	.035048
47"	.1074	.035809
48"	.1097	.036571
49"	.1120	.037333
50"	.1143	.038095
50 1/8"	.1154	.038476
51"	.1166	.038857
51 1/8"	.1177	.039238
52"	.1189	.039619
53"	.1211	.040380
54"	.1234	.041143
55"	.1257	.041905
56"	.1280	.042666
57"	.1303	.043428
58"	.1325	.044190
59"	.1348	.044952
60"	.1371	.045714
61"	.1394	.046476

These constants are derived from the following equation:

$$\frac{\frac{\text{Weight of swatch}}{\text{Area of swatch}} \times (\text{width} \times 36)}{437.5 \text{ grains (1 oz.)}} = \text{Weight in ounces to the given width}$$

Example: If a fabric has a total square weight of 510 grains, what is the weight based on 42 inches?

510 grains × .032000 = 16.32 oz to 42"

or

$$\frac{510}{3} = 170 \text{ grains for one 6-inch square}$$

170 × .0960 = 16.32 oz to 42"

or

$$\frac{\frac{510 \text{ grains}}{(6 \times 18")} \times (42" \times 36")}{437.5 \text{ grains}} = \text{Weight in ounces to a given width}$$

$$\frac{\frac{771120}{108}}{437.5} = \frac{7140}{437.5} = 16.32 \text{ oz to } 42"$$

widths are given in the accompanying table. In order to save time, constants have been devised for the total weight of three 6-inch squares. These constants will be found in the table.

If a weight is known in ounces to one width and the ounces to another width are desired, the calculation may be made as follows:

$$\frac{\text{ounces} \times \text{desired width}}{\text{given width}} = \text{ounces to desired width}$$

Example: A fabric weighs 14.73 oz to 36". What will it weigh based on 22"?

$$\frac{14.73 \times 22"}{36"} = 9.00 \text{ oz to } 22"$$

If a swatch or square of a fabric differing from the regular weight test is used, the weight is figured using one of the following equations. Which equation is used is a matter of choice.

$$\frac{\frac{\text{weight of swatch}}{\text{area of swatch}} \times 1296}{437.5} = \text{ounces per square yard}$$

Having the weight per square yard, the weight can be figured to any desired width. The following equation may be used which will eliminate one calculation.

$$\frac{\frac{\text{weight of swatch}}{\text{area of swatch}} \times (\text{width} \times 36)}{437.5} = \text{ounces to width}$$

It is sometimes desirable to express the weight of a fabric in yards per pound. To do this divide the weight of a linear yard into 16 ounces.

Example: A fabric 36" wide weighs 10.32 oz. Express this weight as yards per pound.

$$\frac{16}{10.32} = 1.55 \text{ yards/pound}$$

Conversely, if the yards per pound are known and the weight in ounces is desired, divide the yards per pound into 16 ounces.

Example: A fabric weight is 1.55 yards/pound and the width is 36". What is the weight expressed in ounces?

$$\frac{16}{1.55} = 10.32 \text{ oz to } 36"$$

Note: The weight of a linear yard is used in this calculation. If the weight is desired to a weight basis which does not correspond to the width, the calculation of the weight to the desired width may be made using the equation given below which has already been discussed.

$$\frac{\text{ounces} \times \text{desired width}}{\text{given width}} = \text{ounces to desired width}$$

Crimp

The crimp of yarn in a fabric is the difference in distance between two points on a yarn as it lies in a fabric and the same two points when the yarn has been removed from the fabric and straightened under specified tension, expressed as a percentage of the distance between two points as the yarn lies in the fabric.

Machine: Crimp Tester manufactured by Brighton Mills (not being manufactured at present)
Capacity: 0 to 38%—Crimp
0 to 28%—Contraction
Calibration: Research Division once each week

The crimp test is usually performed on the sections of the fabric made by cutting out the strength and weight tests. Two parallel lines 8 inches apart are marked on the fabric. Both warp and filling crimp tests are made. Five of the yarns passing through these marks are raveled out to a distance of about 2 inches beyond each mark, care being taken to avoid stretching the yarns.

The yarn is placed on the crimp tester so that the hook holding the weights is caught in the middle of the yarn and the marks placed on the yarn are on the inside edge of the prongs just under the dial of the tester. The crimp is read directly from the dial.

The weight placed on the yarn is expressed in grams and is obtained by dividing 131 grams by the number of thousands of yards of single yarn required to make one pound (Typp yarn number).

Example: To make a crimp test in 10s (single) cotton yarn, what weight is required for the tester?

$10 \times 840 = 8400$ yards per pound

$\frac{8400}{1000} = 8.4$ number of thousands of yards per pound

$\frac{131}{8.4} = 15.60$ grams

Crimp Without Machine

There are times when it is necessary to analyze a very small sample and the use of the Brighton Crimp Tester will not be possible. In a case like this, use the following procedure:

Make two parallel cuts in the fabric and measure the distance between these cuts accurately. (Encompass as much of the yarn as possible.) Ravel out the yarns and by securing one end firmly, straighten the yarn so that the crimp is removed but the yarn is not stretched. The yarn is placed on a ruler for this procedure, and the distance of the straightened yarn is carefully noted. Report each of these distances and calculate the percentage crimp in the following manner:

$$\text{Crimp} = \frac{L - L'}{L'} \times 100\%$$

L = the average distance in inches of yarn under tension
L' = the original length of the yarn before applying tension.

The contraction may be figured by the following equation:

$$\text{Contraction} = \frac{L - L'}{L} \times 100\%$$

Contraction

Contraction or Take-Up is the difference between two points on a yarn and the same two points after the yarn has been woven into a fabric. The contraction is determined in the same manner as the crimp only the inside line on the dial of the tester is read instead of the outside line.

Difference in Crimp and Contraction

It is obvious that, in order to weave a fabric, the warp threads and filling threads must bend around one another. This bending is referred to at times as crimp and at other times as contraction (Take-Up).

Crimp is a laboratory term and has to do with the yarn after it has been placed in a fabric. Contraction (Take-Up) is a mill term used in relation to looms and indicates the percentage the yarn will be shortened by weaving.

There need be no confusion of these terms as long as the purpose of each is remembered. Numerically, the percentage crimp is always higher than the contraction or take-up since the crimp is based on the shorter length.

If either the crimp or the contraction of a fabric is known and the other is desired, use one of the following equations:

$$\text{Crimp} = \frac{100 \times T}{100 - T}$$

Where T = Contraction or Take-Up

$$\text{Contraction} = \frac{100 \times C}{100 + C}$$

Where C = Crimp

Twist

The number of turns about its axis, per unit of length, of a yarn is the twist of that yarn. Twist tests are made on both the warp and filling

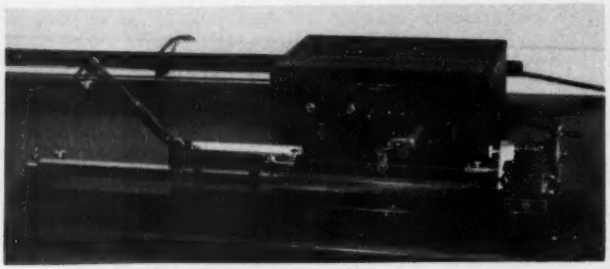


Fig. 18. The electronic twist indicator manufactured by Suter.

yarns but the method for each is the same.

Machine: Twist counter manufactured by Alfred Suter, New York, New York
Capacity: 0 - 20 inches

Plied Yarns

Specimens of the fabric shall measure at least 12 inches and preferably 14 inches in length. In all operations care is exercised to avoid any change in the twist of the yarn to be tested. The actual twist test is as follows:

Holding the yarn to be tested at one end, remove it from the fabric for a distance of about 2 inches and grip it in the stationary clamp of the tester. Remove the yarn for an additional 10 inches, straighten it by applying sufficient tension to remove the crimp and then grip it in the rotatable clamp.

The twist is removed by turning the clamp in the opposite direction of the twist, the number of turns noted, and the average of five different tests reported as the twist or turns per inch.

Single Twist

The single twist is determined in the same manner as the plied twist except that the Electronic Twist Indicator is used. This device is shown in Fig. 18. The twist indicator is a very delicate mechanism and should be used only after verbal instruction; hence, it will only be mentioned here.

An alternate method of determining single twist is exactly the same as the method of determining plied twist except only one inch of yarn is used for the test. This method is very tedious and not altogether reliable. At times the size on the yarn makes impossible the untwisting of the fibers.

The Reverse Twist Method is the best alternate method of determining single twist. The yarn is taken from the fabric in exactly the same manner as the plied yarn, the difference being in the method of untwisting the fibers. The yarn is twisted in the direction of the twist until the yarn just breaks. The number of turns necessary for this operation is recorded. With another yarn the twist is removed from the yarn and reinstated in the opposite direction until the yarn just breaks. The difference between these two processes is divided by 2. An average of five determinations is reported as the turns per inch.

Yarn Number or Size

A conventional relative measure of the fineness or dimension of yarns is known as the yarn number or yarn size. The term "yarn number" is preferable since "size" is used to refer to other properties of yarns and fibers. There are various yarn numbering systems in use in the textile industry. These are a result of the practices in the industry and efforts are being made to simplify these systems into a universal yarn numbering system. A discussion of these systems will be found under "Yarn Analysis."

The number of the yarns used in a fabric is determined by raveling out 5 yards or 180 inches of yarn from the warp and the filling, weighing, and reporting the weight on the upper left hand corner of the analysis sheet for the warp and the upper right hand corner for the filling.

Two lines are marked on the fabric either 18, 15, 12, or 10 inches apart and the yarn is cut and raveled out, either 10, 12, 15, or 18 ends being taken according to the distance being used. ($18 \times 10 = 180$ in., $15 \times 12 = 180$ in., etc.) These ends are weighed in grains and the weight reported on the test sheet. A diagonal line is drawn, and the number of ply is written after the weight.

The yarn number is calculated by using the following procedure:

1. Multiply the percentage contraction by the weight of 5 yards of the yarn.
2. Subtract the product obtained in Step 1 from the weight of 5 yards of yarn.
3. Determine the weight of one yard of yarn.
4. Divide the weight of one yard of yarn by the number of ply to find the weight of one yard of single yarn.
5. Multiply the weight of one yard of single yarn by 120 yards to determine the weight of one skein.
6. Divide the weight of a skein into 1000 grains to find the yarn number.

Example: Find the yarn number if the weight of 5 yards of the 2-ply yarn is 6.1 grains and the contraction is 13.50%.

1. $0.1350 \times 6.1 = 0.82350$
2. $6.10 - 0.82 = 5.28$
3. $5.28 \div 5 = 1.056$
4. $1.056 \div 2 = 0.528$
5. $0.528 \times 120 = 63.36$ weight of one skein
6. $1000 \div 63.36 = 15.78$

The yarn number is reported as 15.78s/2 ply.

Conversion of Yarn Numbers from One System to Another

If a yarn is numbered in one system and it is desired to find the yarn number in any other system, first find the yards per pound of the yarn by multiplying the yarn number by its standard length, and then divide by the standard length of the required system.

Example: What would be the equivalent worsted yarn number of a 12s cotton?

$12 \times 840 = 10080$ yards per pound

$10080 \div 560 = 18$s worsted

If the yarn is a ply yarn, first find its single equivalent, and then use the foregoing method to find the corresponding single equivalent in the required system; then express the yarn in its corresponding form in the new system.

Example: What would be the equivalent worsted yarn number of a 12s/2 ply cotton?

$12 \div 2 = 6$s—single equivalent cotton

$6 \times 840 = 5040$ yards per pound

$5040 \div 560 = 9$s — single equivalent worsted

$9 \times 2 = 2/18$s worsted number

Constants for Converting to Yarn Numbering Systems

In order to accelerate the rate of calculating, certain constants have been devised for the three yarn numbering systems in common use by the West Point Manufacturing Company. These are as follows:

To convert a yarn number from the cotton system to the worsted system, multiply the single cotton number by 1.5. To convert from the worsted system to the cotton system, divide the single worsted number by 1.5. This constant was obtained by dividing the standard lengths of the two systems—840 and 560.

To convert a yarn number from the cotton system to the denier system, multiply the single cotton number by 5314.9. To convert a yarn number from the denier system to the cotton system divide the single denier by 5314.9. This constant was obtained by dividing the standard lengths of the two systems—4,464,528 and 840.

Abrasion Tests

The purpose of an abrasion test is to measure the resistance of a fabric to wear. There are two methods of testing abrasion in use by the West Point Manufacturing Company. These are the Wyzenbeek and Taber Abraser methods. The Wyzenbeek tester is used on the heavy fabrics and the Taber is used on the light fabrics.

Machine: Wyzenbeek Precision Wear Tester (Four Arms) Model A—Manufactured by Wyzenbeek and Staff, Inc., Chicago 22, Illinois. Must be calibrated by Wyzenbeek.

Taber Abraser—Model E-4010—Manufactured by Alfred Suter, New York, New York.

Since A. S. T. M. has not standardized the abrasion testing techniques, the results obtained on these machines are used only in a comparative manner.

Wyzenbeek Test

Strips of fabric to be tested are cut 1¾ inches in width and 9 inches in length in the warp direction. After the fabric strips have been inserted in the clamps and the weights leveled, the distances between the clamps should be 6 inches. The half cylinder is covered with 2/0 emery cloth. After each 25 strokes the emery cloth is brushed to remove the residue of abrasion. After each 100 strokes the emery cloth is changed.

The wear test continues until the fabric strip is completely worn through and the weights have dropped against the supporting bar. The average of four tests (one test each arm) is reported as the number of rubs necessary to "wear out" the fabric. This machine is shown in Fig. 19.

Taber Abraser

Five circular pieces of the fabric to be tested are cut, having a diameter of about 5 inches. These circular pieces of fabric are mounted on the turntable and placed on the machine. The weighted arms holding the abrasive wheels are lowered on the turntable and the test begun. The average of the five tests is reported as the number of cycles necessary to "wear out" the fabric. This machine is shown during a test in Fig. 20.

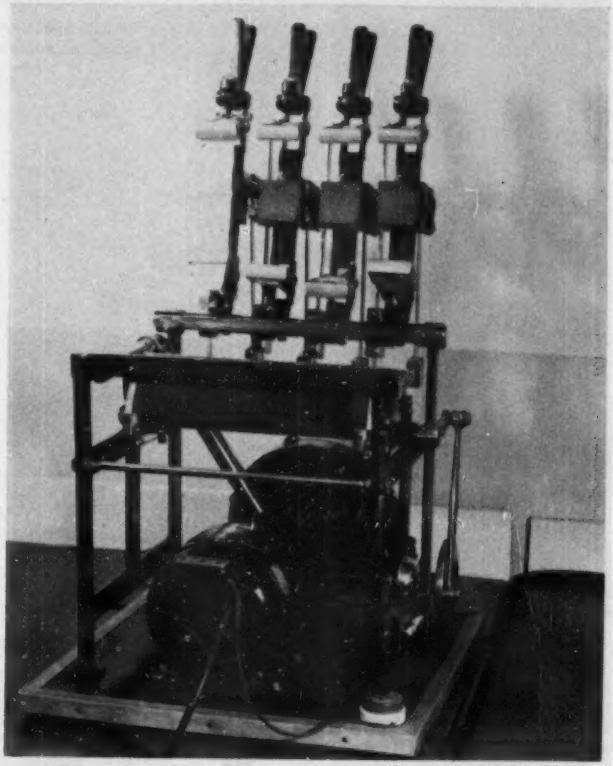
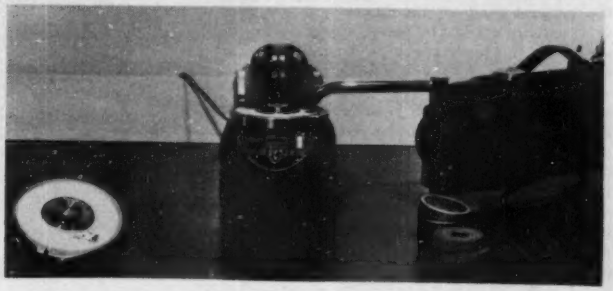


Fig. 19. Wyzenbeek machine for testing wearability of fabrics.

Fig. 20 (below). The Taber Abraser. Vacuum unit is at right.



Bursting Strength

The ability of a fabric to resist rupture by pressure is known as the bursting strength.

Machine: Mullen Tester—Model A —Manufactured by B. F. Perkins Co., Holyoke, Mass.
Capacity: 400-1500 lbs.
Calibration: Checked by the Research Division; calibrated by B. F. Perkins Co.

The Mullen Tester operates on the hydraulic principle. The material to be tested is clamped over an opening in the cylinder which has been filled with glycerine and sealed with a pure gum rubber diaphragm. By use of a motor drive the glycerine is forced against the rubber diaphragm which in turn exerts pressure against the fabric until it bursts. The burst is at the weakest point of the fibers and represents what a sufficient strain would do to the material in actual use.

The glycerine also acts directly on a pressure gauge which records the bursting strength in standard terms of actual pounds per square inch. At the bursting point the indicator on the gauge remains stationary, giving a positive record of the test. This machine may be observed in Fig. 21. An average of five tests is reported as the bursting strength of the fabric.

Inclined Plane No. 4; Bursting Attachment

An attachment is available for the Inclined Plane No. 4 tester which may be used on very light fabrics. This attachment is shown in Fig. 22. The Inclined Plane Testers are described fully in the section on "Yarn Analysis."

Universal Wear Tester

The Universal Wear Tester shown in Fig. 22A is set up for flat abrasion. There are three types of abrasion tests that may be made on this tester —flat, flex, and edge abrasion.

Machine: CSI-Stoll-Quartermaster Universal Wear Tester—Model C22C-006—manufactured by the Custom Scientific Instrument Company, Inc., Post Office Box 170, Arlington, New Jersey.

Some of the advantages of the Universal Wear Tester are the establishment of an endpoint which is independent of individual judgment and can be quantitatively defined; the obtaining of test results whose variation due to the machine is insignificant when compared to the variation within the sample itself; the capability of measuring the quantity of abrasion action and abraded material; and the obtaining of excellent correlation of results with wear service.

The main parts of the tester are the frame work, the driving mechanism, abrasion head, pneumatically controlled rotary sample clamp mechanism, pneumatic tension control system, special edge abrasion clamps, flat abrasion table with tension and folding device, and electrical devices for pressure control and endpoint stop.

Flat Abrasion (Universal)

The test specimens are circular in shape with a diameter of 4¼ inches. No two specimens should contain the

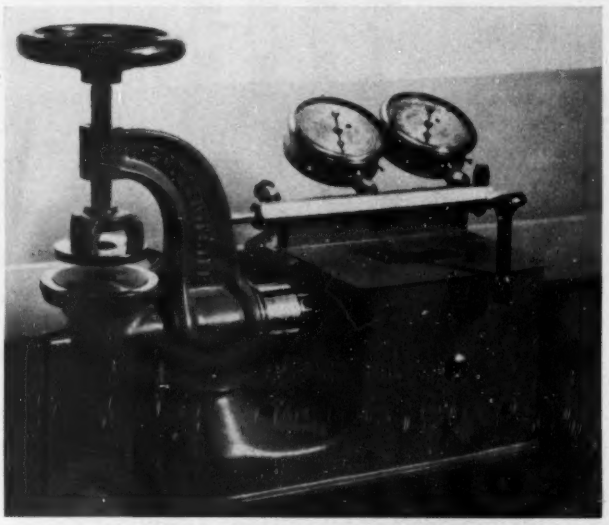


Fig. 21 (left). The Mullen tester for fabric bursting strength.

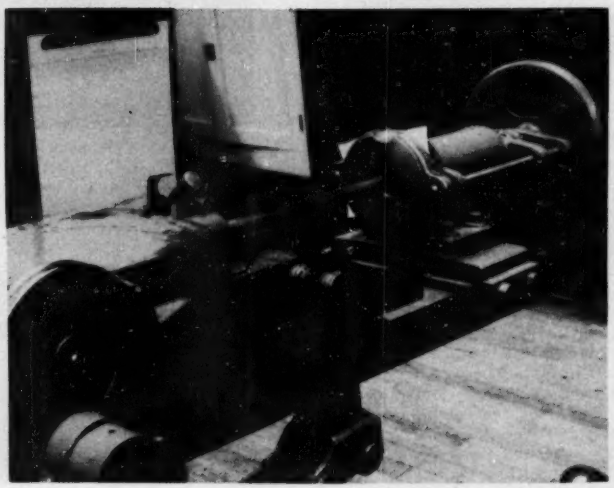


Fig. 22 (below). Bursting attachment for Inclined Plane No. 4 tester.

same warp and filling yarns. The specimen is mounted in a circular clamp by means of a clamping ring and tightening collar. A metallic contact pin is sealed into the center of the diaphragm so that it is flush with the diaphragm surface. Air pressure under the diaphragm is constant and is maintained at approximately 5 pounds per square inch.

The abradant is No. 0 emery cloth. The abradant plate has a contact pin adjustable to the thickness of the abradant. The contact made by this adjustable pin and the contact pin inserted into the center of the diaphragm closes a low-voltage circuit and stops the machine, thus making an automatic endpoint.

The test procedure is as follows:

1. Place the test specimen over the diaphragm smoothly without distortion and clamp into position.
2. The abradant is placed on the abrading plate with just enough tension to hold the abradant smoothly. The contact pin reaching through a hole in the abradant should be even with the surface of the abradant.
3. Air pressure of approximately 5 pounds per square inch is applied to the diaphragm.
4. Weights are applied to the abrading plate, using the following table as a guide:

For Fabrics Weighing	Load, lb
Up to 2.5 oz/sq yd	2
2.5 up to 5.0	3
5.0 up to 7.5	4
7.5 up to 10.0	5
10.0 up to 15.0	6
15.0 and above	7

5. If unidirectional abrasion is specified the rotating mechanism is disconnected.
6. The abrading head is lowered into test position and the test started. The machine may be stopped at any time and the specimen inspected without any damage to the test.
7. The average of the 5 specimens is reported as the number of cycles necessary to wear out the fabric.

Flex Abrasion (Universal)

In this test the specimen is subjected to unidirectional reciprocal folding and rubbing over a bar under known conditions of tension and pressure.

The test specimens are cut not less than 8 inches in length and 1¼ inches in width if the yarns per inch are more than 50, or 1½ inches in width if the yarns per inch are less than 50. The specimen is raveled to one inch in width by taking approximately the same number of ends or picks from each side of the specimen. No two specimens for the warp test shall contain the same ends and no two specimens for the filling test shall contain the same picks.

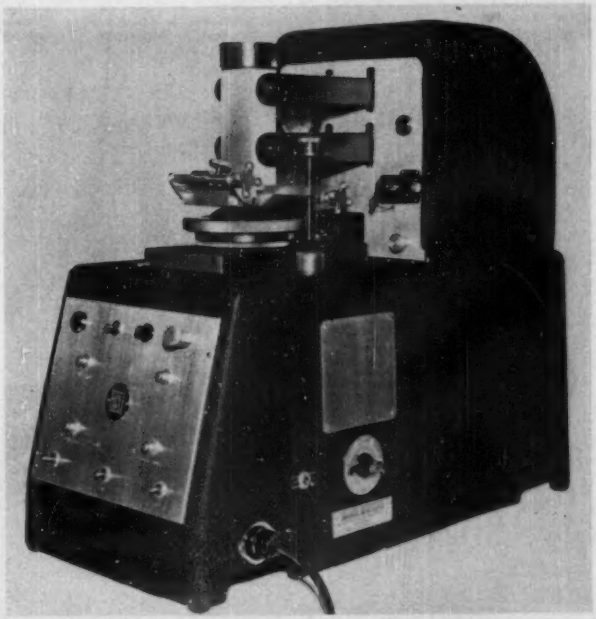


Fig. 22A. The CSI-Stoll-Quartermaster Universal Wear Tester. In this photo the machine is set up for flat abrasion tests.

The plate assembly consists of two sets of plates: the pressure (upper) plate and the reciprocating (lower) plate. The weights used on the pressure plate are determined in the same manner as described in flat abrasion. The rotating mechanism is disconnected for flex abrasion so that a unidirectional movement is obtained. The plates are equipped with clamps that permit the folded specimen to be aligned with the axis of motion of the reciprocating plate. The folding bar or blade assembly is attached to the reciprocating plate. The machine stops when the specimen is ruptured.

The test procedure is as follows:

1. The specimen is fastened in the clamps of the upper and lower plates so that the specimen goes around the folding bar.
2. The proper weights are applied to the pressure plate.
3. The specimen is inspected from time to time during the test so that pills of matted fiber debris interfering with proper contact between the folding bar and the specimen may be removed.
4. The average of 5 specimens is reported as the number of cycles necessary to wear out the fabric.

Edge Abrasion (Universal)

A special edge-abrasion clamp is provided with the tester and is mounted in the rotary clamp in the place of the rubber diaphragm. Strips of the fabric may be cut in any direction—warp, filling, or bias. There are no special requirements made for the dimensions of the strips except that they be small enough to fit the clamp. The abrading head is the same as used for flat abrasion. The specimens may be abraded by either uni- or multidirectional motions.

Moisture Content and Regain

The moisture present in a fabric is expressed as a percentage of the weight of the sample to either of the following bases:

1. Original Weight — Moisture Content
2. Oven-Dry Weight — Moisture Regain.

The A.S.T.M. procedures for the determination of moisture will be found in their *Standards on Textile*

Materials under their designation D 629-46T, Item 4.

Machine: Brabender Semi-Automatic Moisture Tester—Model 401—manufactured by The Brabender Corporation, Rochelle Park, New Jersey.
Capacity: Ten Baskets—40 to 160 degrees Centigrade—0 to 25% Moisture Content.
Calibration: Checked before each series of tests by the Research Division—calibrated by The Brabender Corporation.

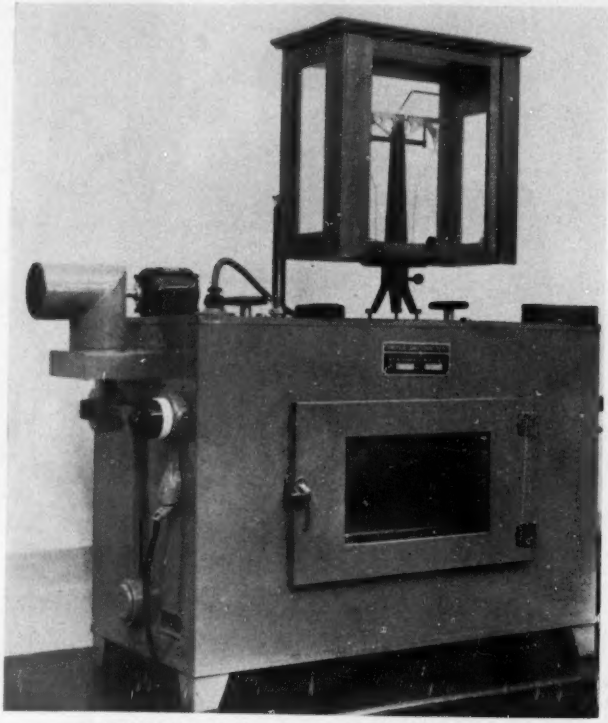
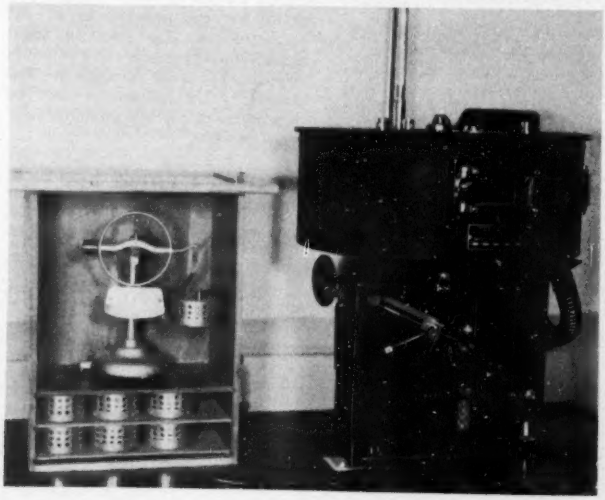


Fig. 23 (above). The Emerson conditioning oven.

Fig. 24 (below). The Brabender oven. Special balance is at left.



Machine: Emerson Conditioning Oven—manufactured by Emerson Apparatus Co., Melrose, Mass.
Capacity: Eight baskets—60 to 300 degrees Fahrenheit.
Calibration: Checked every six months by the Research Division—calibrated by Emerson Apparatus Co.

Emerson Test

The specimen taken for the moisture test should be approximately as large as a 6-inch square. The outer edges of the specimen are raveled so that no ends will be lost during the test. The specimen is placed in a basket and weighed on the grain balance on top of the oven. This weight is recorded.

The sample is placed in the oven and dried until successive weighings spaced 15 minutes apart show no change in weight. This will ordinarily take 45 minutes at 220-230 F. The sample is weighed inside the oven and the weight recorded. The weighing is accomplished by means of a suitable hanging device and counterweights furnished with the oven. The Emerson oven is shown in Fig. 23.

The moisture content and regain may be calculated by using the following equations:

$$\text{Moisture Content} = \frac{A - B}{A} \times 100\%$$

$$\text{Moisture Regain} = \frac{A - B}{B} \times 100\%$$

Where
A = Weight of sample before drying
B = Weight of bone-dry sample.

Brabender Test

The procedure for the Brabender test is essentially the same as for the Emerson test. For the Brabender test a constant weight of sample is used—10 or 5 grams—and a special balance is provided for this purpose. The sample is cut into small pieces in order to adjust the weight to the exact amount. The basket containing the sample is left inside the oven until there is no change in successive readings taken 15 minutes apart. This will ordinarily take 35 minutes at 105-110 C.

By means of a built-in scale and balance on the oven, the moisture content is read directly from a dial

on the oven. A table for the conversion of the moisture content percentage to moisture regain percentage has been prepared to eliminate calculations. The table will be found with the oven. The Brabender oven is shown in Fig. 24.

Before readings are made on the Brabender oven, a check must be made to determine if the balance of the oven is properly adjusted. To accomplish this, place an empty basket in the oven and leave for about 15 minutes so that the basket will have the same temperature as the air inside the oven. Place the 10 gram weight in the cup on the balance, suspend the basket on the balance by use of the lever on the side of the oven and observe the reading on the dial. This reading should be zero.

If the reading should be slightly off, adjustments are made by using the footscrews. If the reading is more than 2 per cent off, then the oven should be calibrated. No attempt should be made to calibrate the oven without detailed instructions which are furnished by the manufacturer and will not be discussed here. If this calibration does not succeed in adjusting the oven, then the oven must be returned to the manufacturer for overhauling.

If either the moisture content or regain is known and the other is desired, one of the following equations may be used:

$$\text{Moisture Content} = \frac{100 \times R}{100 + R}$$

Where R = moisture regain

$$\text{Moisture Regain} = \frac{100 \times C}{100 - C}$$

Where C = moisture content.

OPTIMUM SAMPLE SIZE

Type of Test	Sample Size
Strength - Grab	25 inches in length if the width is 36 inches or more—36 inches in length if the width is less than 36 inches.
Strength - Strip	Same as for grab strength
Strength and Weight	Same as for grab strength
Part Analysis	Same as for grab strength
¾ Analysis	A linear yard
Full Analysis	A linear yard

If abrasion tests, tear tests, or any other type of tests are desired, it is well to have a sample at least 1½ yards in length.

MACHINE OILING SCHEDULE

Machine	Type of Oil	Frequency
Vertical Tester—Model J-2	S. A. E. 20 motor oil	Daily
Horizontal Testers—Model Q	S. A. E. 20 motor oil	Daily
Wyzenbeek Wear Tester	S. A. E. 20 motor oil	Daily
Twist Counter	Light weight spindle oil	Weekly

It is the duty of each technician in the testing room to ascertain whether or not a machine has been properly oiled before he uses the machine.

Ounces of Warp and Filling

As a means of checking a full analysis of a fabric, it is necessary to check the combined ounces of warp and filling against the weight of the fabric as figured in the regular procedure. As seen from the equation, a major portion of the analysis is considered in this calculation:

$$\text{Ounces of Warp} = \frac{\text{Width} \times \text{warp count} \times (1 + \text{crimp \%}) \times \text{number of ply} \times \text{weight of 1 yard of single warp yarn in grains}}{437.5 \text{ grains (1 oz)}}$$

The ounces of filling are figured in the same manner, substituting filling values for the warp values in the equation. The combined ounces of warp and filling should be not more than 5 per cent different from the weight as figured in the regular procedure. If an analysis should work out with a difference in the two weights of more than 5 per cent, then the analysis is checked for errors.

Yarn Analysis

Yarn analysis encompasses any or all of the following tests: yarn number, strength (skein or single end), elongation, twist, and moisture content or regain.

A description of the various yarn tests will be found in the *A.S.T.M. Standards on Textile Materials* under their designation D 180-49T.

Yarn Number

In the textile field there are several terms used to designate the relative size of yarn. These terms are yarn size, yarn number, and yarn count. Since the term "count" is used to designate the number of warp or filling yarns per inch in a fabric and "size" is used in connection with the warp sizing compounds used in the slashing process, the term "yarn number" will be used to designate the relative sizes of yarns.

Yarn Numbering Systems

There are several yarn numbering systems used with the various fibers. These various systems are the result of the practices of the industry, and efforts are being made to simplify the matter. The basis of all numbering systems is the relation between weight and length. Two basic methods are used: (a) the reciprocal, generally used on yarns spun from fibers, and (b) the direct, generally used on yarns composed of filaments.

The reciprocal systems express the yarn number as the number of units of standard length necessary to balance one unit of standard weight.

YARN NUMBERING SYSTEMS

System	Length/lb	Number
Cotton (hank)	840 yds. weighing one pound	= 1s yarn
Asbestos (cut)	100 yds. weighing one pound	= 1s yarn
Glass (cut)	100 yds. weighing one pound	= 1s yarn
Linen (hank or lea)	300 yds. weighing one pound	= 1s yarn
Rayon, Spun (Typp)	1000 yds. weighing one pound	= 1s yarn
Spun rayon is also numbered the same as cotton or worsted yarns depending on the manufacturer.		
Silk, Spun (hank)	840 yds. weighing one pound	= 1s yarn
Woolen (cut)	300 yds. weighing one pound	= 1s yarn
Woolen (run)	1600 yds. weighing one pound	= 1s yarn
Woolen(Typp)	1000 yds. weighing one pound	= 1s yarn
Rayon (filament) and Silk (raw or thrown)	number of unit weights of 0.05 grams per 450 meter length	= 1 denier
"Grex"	the weight in grams of 10,000 meters of yarn	

The direct systems express the yarn number as the number of standard units of weight necessary to balance a standard unit of length. The various yarn numbering systems are given herewith.

The "Grex" yarn numbering system is the universal yarn numbering system proposed by the American Society for Testing Materials. The three yarn numbering systems used by the West Point Manufacturing Company are the cotton, worsted, and denier systems. Cotton and worsted yarns are on the reciprocal system; that is, as the yarn number increases the yarn size or diameter decreases. Filament yarns are on the direct system; that is, as the yarn number increases the yarn size or diameter increases.

Determining Numbers in Laboratory

To determine the relative numbers of yarns in the laboratory obviously necessitates a smaller yardage than is contained in the standard units. The standard length of yarn used on the cotton system for determination of yarn number is 120 yards. For worsted yarns this length is 80 yards, and for the denier system the length is 90 meters. The reel shown in Fig. 25 is used to measure accurately the yards of yarn in a skein.

For filament yarns either a special reel measuring in meters is used or the test is made on the cotton system and the corresponding denier is calculated as shown on page 123 in the section on "Fabric Analysis." The reel consists of six arms of such a length that the perimeter of the hexagon formed by wrapping the yarn around the arms is 1½ yards. The reel is operated by a crank.

A revolution counter calibrated in yards is attached to measure the number of yards reeled. This counter can be set to reel any number of yards, and a bell is connected so as to give a warning ring just before one complete revolution of the counter. The yarn may be reeled from a cone, spool, bobbin, or skein, passing through the two sets of pigtails which spread the yarn uniformly on the reel. The two ends of the yarn are tied together in a square knot, thus making a skein.

The skein is placed on the conditioning rack where it remains for a minimum of 4 hours before weighing. The weight of the skein in grains after conditioning divided into 1000 grains will give the yarn number. The reason the weight in grains of a 120-yard skein or of an 80-yard skein divided into 1000 grains will give the yarn number is best explained by the following equations:

$$\frac{120 \text{ yards}}{840 \text{ yards}} = \frac{1}{7}$$

$$\frac{80 \text{ yards}}{560 \text{ yards}} = \frac{1}{7}$$

$$\frac{1000 \text{ grains}}{7000 \text{ grains}} = \frac{1}{7}$$

7000 grains = 1 pound

In the same manner on the denier system, the equations are:

$$\frac{90 \text{ meters}}{450 \text{ meters}} = \frac{1}{5}$$

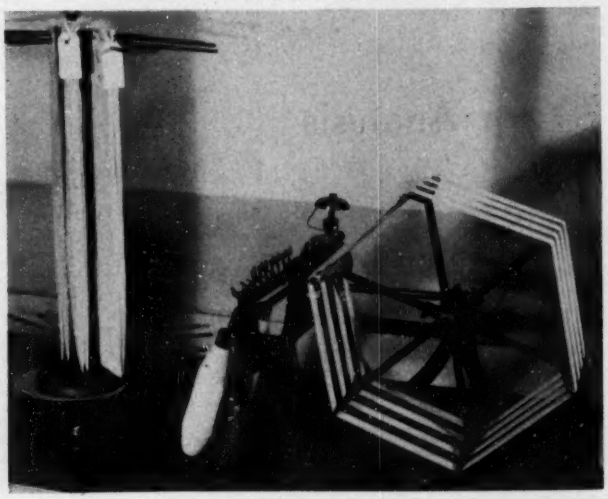
$$\frac{.01 \text{ grams}}{.05 \text{ grams}} = \frac{1}{5}$$

To accelerate the rate of testing, a quadrant has been devised which is calibrated to give the yarn number when the skein of yarn is placed on the hook as shown in Fig. 26. Before each series of tests the quadrant is checked with a weight which is equivalent to a 7s yarn. Both the reel and the quadrant are manufactured by Alfred Suter.

Yarn Strength

There are two methods of determining the yarn strength used by the Testing Department — skein and single strand or end. The skein method is more generally used than is the single strand method because

Fig. 25. Yarn reel (right) and yarn conditioning rack.



for many years this was the only method of testing yarn strength, and more yarn can be tested faster.

However, there are certain aspects of the skein test which are undesirable. The skein test minimizes the variation in the yarn and fails to show the weakest point in the yarn. For a more complete picture of the yarn strength the single strand test must be used.

Skein Test

Machine: Vertical Tester—Model J-2—manufactured by Scott Testers, Inc., Providence, R. I.
Capacity: 300 lb without weight
500 lb with weight
Calibration: Once each month by Research Division. Machine overhauling by Scott Testers, Inc.

A skein of yarn prepared in the same manner as the skein for the yarn number is placed over the spools of the testing machine. The skein is straightened so that the yarns do not overlap. A skein being tested is shown in Fig. 27. As the spools separate, it is well to hold the knot where the ends are tied together lightly between the fingers to ascertain whether or not slippage is occurring during the test. If slippage occurs, a new skein must be tested. The breaking strength in pounds is read directly from the dial of the machine which stops when the yarn is broken.

Yarn Factor

As a general rule, a request for the skein test includes the yarn number and yarn factor. Thus, the same skein which is used for determination of the yarn number is also used for the strength test. The term "yarn factor" is obtained by multiplying the average yarn number by the average yarn strength. The yarn factor is sometimes called the "yarn number-strength product." The yarn factor is especially useful in comparing yarns of different numbers and, consequently, different strengths.

Single Strand Strength

There are two machines of the inclined plane type used by the Testing Department for single strand yarn testing. The results are reliable and consistent. The inclined plane machines have a uniform rate of loading because the elongation of the specimen does not affect the rate at which the load is applied. The two machines of the inclined plane type are the same except for capacity and are usually referred to by their numbers—IP-2 and IP-4.

Machine: Inclined Plane Nos. 2

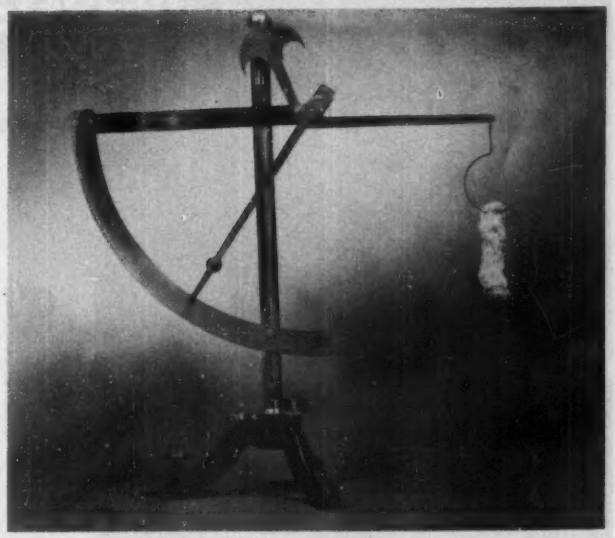
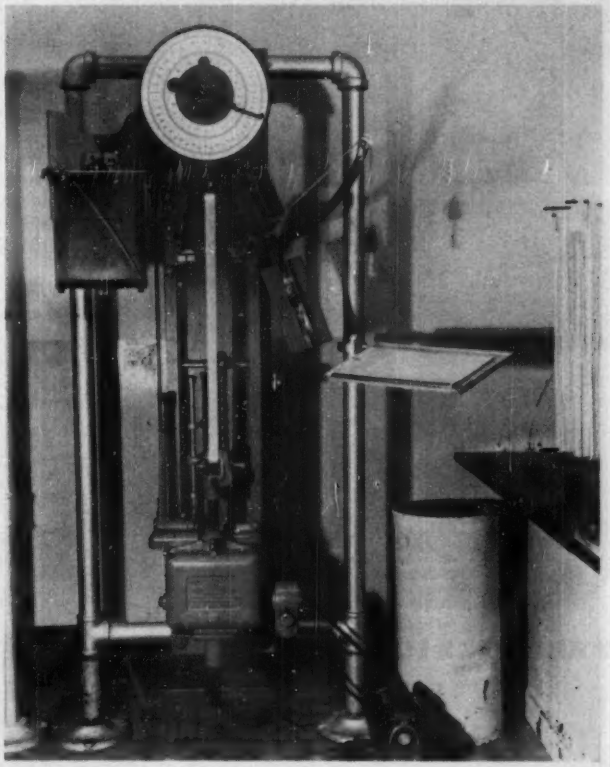


Fig. 26 (above). Yarn numbering scale by Suter.

Fig. 27 (below). Vertical type skein yarn strength tester (Scott Model J-2).



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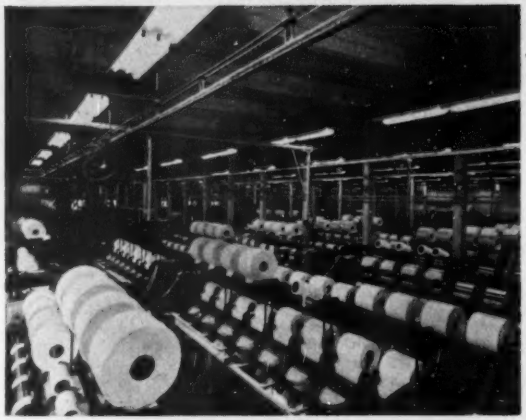

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and 4—manufactured by Scott Testers, Inc., Providence, R. I.
Capacity: IP-2—250, 500, 1000 and 2000 grams
IP-4—25 lb without weight
50 lb with weight
Calibration: Inclined plane machines calibrated once each month by the Research Division

IP-2 Test

This machine makes a chart of the test which is a permanent record of the test. In performing the test, place the chart in its proper position (there are guides) and set the recording pen to zero. The distances between the jaws should be 10 inches ± 1/32 in. The yarn is secured in the moving jaw and then passed through the stationary jaws through the tension device. The device has a weight attached by means of arms which form a right angle.

The tension on the yarn should be such that one of the arms of the angle is parallel to, and exactly in front of, the post holding the device. The stationary jaw is secured. The machine when started tilts the entire arm holding the jaws to an incline. When the yarn breaks, the pen is immediately lifted from the chart.

Approximately 10 yards of yarn are reeled off the package and the next break prepared. The package may be a spool, bobbin, cone, skein, etc. Ten breaks are made on each package. The strength in grams and the elongation are read directly from the chart and recorded. An average of the ten breaks is determined. The average strength of the yarn is converted from grams to ounces by multiplying the strength in grams by 0.0353. The coefficient of variation is

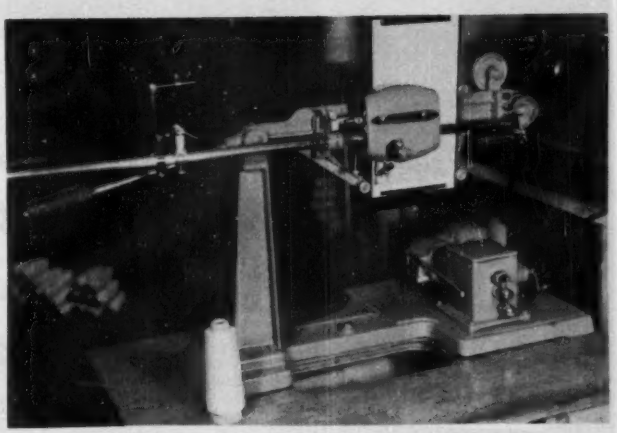

Fig. 28. Scott's Inclined Plane Tester, IP-2.

calculated in the following manner:

$$\frac{\text{Average Range (high-low)} \times 0.325}{\text{Mean (average) of all bobbins}} \times 100\% = \text{C.V. \%}$$

The IP-2 test is shown in Fig. 23. This test is used on fine single yarns.

IP-4 Test

This test is performed in a manner similar to the IP-2 test. The tester is used for heavy single yarns and plied yarns. The strength results are given in pounds. There is no tension device and the pen is moved over on the chart two spaces after each break. The coefficient of variation is not calculated on this test unless specified. Otherwise the two tests are the same.

Each of these machines is oiled before each testing series with S.A.E. 20 motor oil.

Twist

Whenever a twist test is desired on a yarn, this test is performed in exactly the same manner as a twist test on the yarn from a fabric. The only difference is that several yards are drawn from the package between each individual test, and the average reported is the average of 10 specimens.

Moisture Test

When a moisture test is desired on yarn, approximately a skein of yarn is used as the sample size. Otherwise the test is the same as for a fabric.

Fiber Analysis

Fiber analysis is composed of the following parts: length, strength, fineness, maturity, and fiber identification. These tests are discussed in detail in the *A.S.T.M. Standards on Textile Materials* under their designations D 276-49T, D 629-46T and D 414-49T.

The best way to learn fiber analysis is from an experienced operator. In fact, personal instruction is a necessity. The techniques involved can be described, but full comprehension comes only after verbal instruction and considerable practice.

Preparation of Samples and Specimens

The laboratory test sample is taken from the laboratory bulk sample by spreading the sample into a thin layer and taking pinches of cotton (each weighing approximately 25 mg) from the top and bottom layer of the sample. If the size of the sample is large enough, a composite test sample of 48 pinches is taken.

The fibers of the laboratory test subsample are straightened and made parallel by gently pulling and lapping with the fingers. Motes, leaf, stem, and other foreign matter are gently removed from the sample, care being taken not to break any of the fibers.

Fiber Length Array

The length array determines not only the length of the fibers but also the percentage of fiber at each unit of length. The equipment needed for

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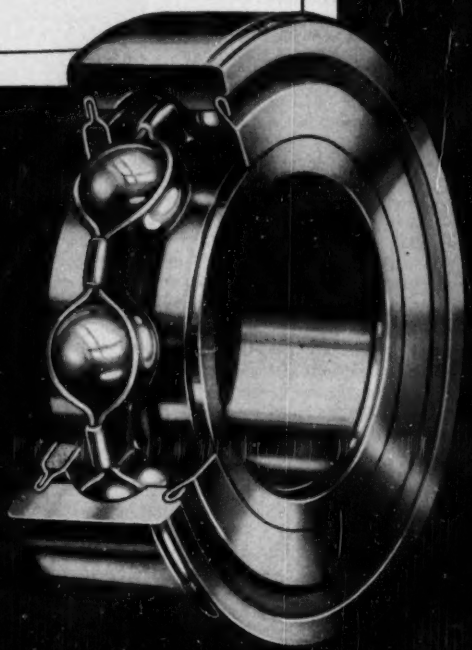

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an array is pictured in Fig. 29. Alfred Suter of New York City manufactures this array equipment.

A 75-mg test specimen is laid carefully upon and inserted by pressure of the fingers and depressor into one set of the combs. With forceps, especially constructed for this purpose, a few of the protruding fibers are gripped on the ends nearest the operator, gently and smoothly withdrawn and placed in the other set of combs as nearly straight as possible.

As the transferred fibers are released from the forceps, they are carefully pressed down between the teeth of the combs by means of the depressor. This process continues until all the fibers in one set of combs have been transferred to the other set of combs. As the transfer proceeds, the combs are dropped as may be necessary to grip the shorter fibers.

The sorting apparatus is revolved 180 degrees and the fibers are transferred for a second time onto the first set of combs in the manner just described. The straggling fibers and fibers loosely protruding from either the nearest or most remote combs are gently withdrawn, laid over the specimen, and repressed into the combs.

After the second transfer of fibers the combs are revolved 180 degrees so that the ends of the fibers that were farthest from the operator may be gripped as the combs are dropped. This enables the selection of the longest fibers first. The withdrawing is made in small "bites" with the forceps on the longest fibers first. These fibers are placed on a black velvet-covered board with short spacings between each grouping. The base line of the fibers is kept as straight as possible in order to facilitate measuring.

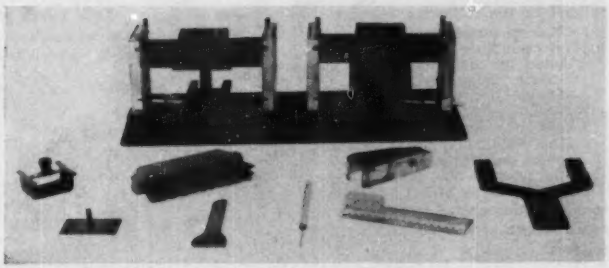


Fig. 29. Equipment needed for making a fiber array.

Beginning with the longest fibers first laid down, the length of each group is carefully measured—cotton fibers in 1/16 inches, Rayfiber in ⅛ inches; wool array combs are marked in ½ inch intervals, thus laying down of the fibers is not necessary. All the groups having the same length are combined and weighed, and this weight reported beside the proper length. The calculations made on an array are the 25% point, mean length, coefficient of variation, calculated classers' length, and effective length percentage. Shown herewith is a fiber length array of the 1 inch Official U. S. Government Standard with the calculations discussed step by step.

FIBER LENGTH ARRAY OF ONE INCH OFFICIAL U. S. GOVERNMENT STANDARD*

Fiber Length Class (1) 1/16"	Mid Point Length Class (x) 1/32"	(x^2)	Fiber Weight Each Class (mg)	Fiber Weight Per Cent (f) %	Effective Length $\frac{x - 12}{x} \times 100\%$ %
22-23	45	2025	.30	.2	73.33
21-22	43	1849	1.20	.8	72.09
20-21	41	1681	1.84	1.2	70.73
19-20	39	1521	7.90	5.4	69.23
18-19	37	1369	12.70	8.6	67.57
17-18	35	1225	21.58	14.6	65.61
16-17	33	1089	22.06	14.9	63.64
15-16	31	961	19.92	13.5	61.29
14-15	29	841	12.72	8.6	58.62
13-14	27	729	11.20	7.6	55.56
12-13	25	625	9.02	6.5	52.00
11-12	23	529	6.26	4.2	47.83
10-11	21	441	5.64	3.8	42.86
9-10	19	361	2.54	1.7	36.84
8- 9	17	289	3.20	1.5	29.41
7- 8	15	225	2.10	1.4	20.00
6- 7	13	169	1.72	1.3	7.69
5- 6	11	121	1.56	1.1	0
4- 5	9	81	1.30	.9	0
3- 4	7	49	1.18	.8	0
2- 3	5	25	1.10	.7	0
1- 2	3	9	1.02	.7	0
			147.66	100.0	

*U. S. Dept. of Agriculture

Array Calculations

25% Point

The 25% point includes 25 per cent of the arrayed fibers by weight, the measuring beginning with the longest fibers. The 25% point is calculated in the following manner:

1. Divide the total fiber weight by 4. Record this result.
2. Beginning with the longest fiber length group, add the weights of each fiber weight class until the value obtained in Step 1 is equaled or is included in one of the groups.
3. Record the length in decimal value of the last group in Step 2.
4. Subtract the value obtained in Step 1 from the value obtained in Step 2 and divide the weight of fibers in the last group added in Step 2; multiply the result by the class interval and record the result in decimal form.
5. Add the value obtained in Step 4 to the value obtained in Step 3 and express the result to the nearest 1/32 in. This value is the 25% point.

Using the array of the 1 inch Government Standard as an example the 25% point would be calculated as follows:

1. 147.66 ÷ 4 = 36.92
2. The result of the addition in Step 2 is 45.52
3. The decimal value of the last group in Step 2 is 1.06250000
4. 45.52 — 36.92 = 8.60
   (8.60 ÷ 21.58) × 1/16" = 0.02490732
5. 1.06250000 + 0.02490732 =
   1.08740732 = 1 2/32"

The above steps are usually written altogether in the following manner:

$$\frac{147.66}{4} = \frac{\begin{matrix}45.52\\36.92\end{matrix}}{8.60} \times 1/16" = \frac{\begin{matrix}1.06250000\\0.02490732\end{matrix}}{1.08740732} = 1\ 2/32"$$

Mean Length

The average fiber length is the mean length. The mean length is cal-

culated in the following manner:

1. Make a summation of the weight of each fiber length class multiplied by the mid-point of each length class.
2. Divide this summation by the total weight of the fibers.
3. Multiply the result of Step 2 by the decimal value of the mid-point and express this result to the nearest 1/32 in.

Using the array of the 1 inch Government Standard as an example, the mean length would be calculated as follows:

$$\text{Mean Length} = \frac{\mathcal{E}\ (x \times \text{weight})}{\text{total weight}} \times 1/32''$$

$$\text{Mean Length} = \frac{4378.74}{147.66} \times .03125 = 0.92669 = 30/32''$$

Coefficient of Variation

Simply said, the coefficient of variation is the standard deviation expressed as a percentage of the average. To obtain the coefficient of variation, divide the standard deviation by the mean length (decimal value).

Standard Deviation

The standard deviation is calculated in the following manner:

1. Make a summation of the weight percentage of each fiber class multiplied by the square of the mid-point of each class (fx^2). Record this value.
2. Make a summation of the weight percentage multiplied by the mid-point (fx). Square this value and divide by 100 per cent.
3. Subtract the value obtained in Step 2 from the value obtained in Step 1. Divide the result by 100 per cent.
4. Extract the square root of the value obtained in Step 3 and multiply by the decimal value of the mid-point.

Using the array of the 1 inch Government Standard as an example the standard deviation is calculated as follows:

$$SD = \sqrt{\frac{\Sigma fx^2 - \left(\frac{\Sigma(fx)^2}{100}\right)}{100}} \times 0.03125 \left(\tfrac{1}{32}''\right)$$

$$SD = \sqrt{\frac{93556.8 - 87805.5}{100}} \times 0.03125$$

$$SD = 0.23688$$

$$\text{Coefficient of Variation} = \frac{\text{Standard Deviation}}{\text{Mean Length}} \times 100\%$$

$$C.V. = \frac{0.23688}{0.92669} \times 100\% = 25.56\%$$

Effective Length Index

The effective length of an array of fibers is an index as to the percentage of the fibers that contribute to the strength of the yarn made from those fibers. This index* was developed by W. S. Smith of the Research Division.

The effective length index is calculated in the following manner. Make a summation of the weight percentage of each fiber length class multiplied by the effective length percentage for each fiber length class and report this value on the array graph as well as the sheet containing the array data.

A graph of the array is drawn using the weight percentage at the various lengths. A typical graph may be seen in Fig. 29A. This graph has its columns drawn from the mid-point of each individual length group. The results of the array calculations as well as pertinent sample information are given on the graph.

Arrays are sometimes made using a different class interval from the example given. Wool arrays, for example, are measured in one-half inch intervals and Rayfiber is measured in one-eighth inch intervals. The reason for this is the length of the fibers being measured. The longer the fiber the longer the class interval. The calculations are made in exactly the same manner as on the one inch Government Standard, but instead of a 1/32 inch mid-point for each class, the mid-point for the ½ inch class length would be in ¼'s and the mid-point of the ⅛ inch class length would be in 1/16's. The preparation of the graph is essentially the same as the one given in the illustration.

Fibrograph Test

The length of fibers as determined by the Fibrograph is a mechanical measuring of the length of fibers; the machine may be seen in Fig. 30.

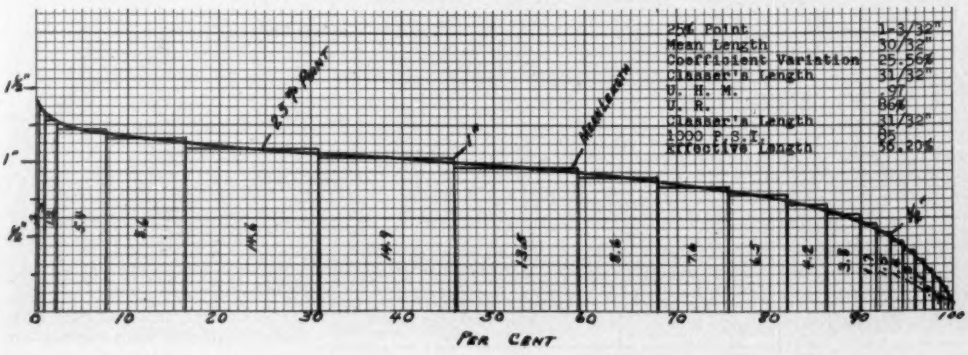
Machine: Fibrograph—developed by Dr. K. L. Hertel of the University of Tennessee and manufactured by the Fulton Sylphon Company, Knoxville, Tenn.
Calibration: Check before each series of tests - calibrated by the Fulton Sylphon Co.

Before a series of tests may be made, the Fibrograph must be balanced. This is accomplished by the following procedure:

1. Turn the machine on.
2. Turn the galvanometer switch to "off." The light image should rest on the central mark of the index. If the light image does not, then turn the adjustment knob on the right side of the

*Published in "Rayon Textile Monthly," Dec. 1943.

Fig. 29A. Fiber Length Distribution. 1" Staple. Official cotton standard of United States (American Upland). Not valid after August 2, 1949.



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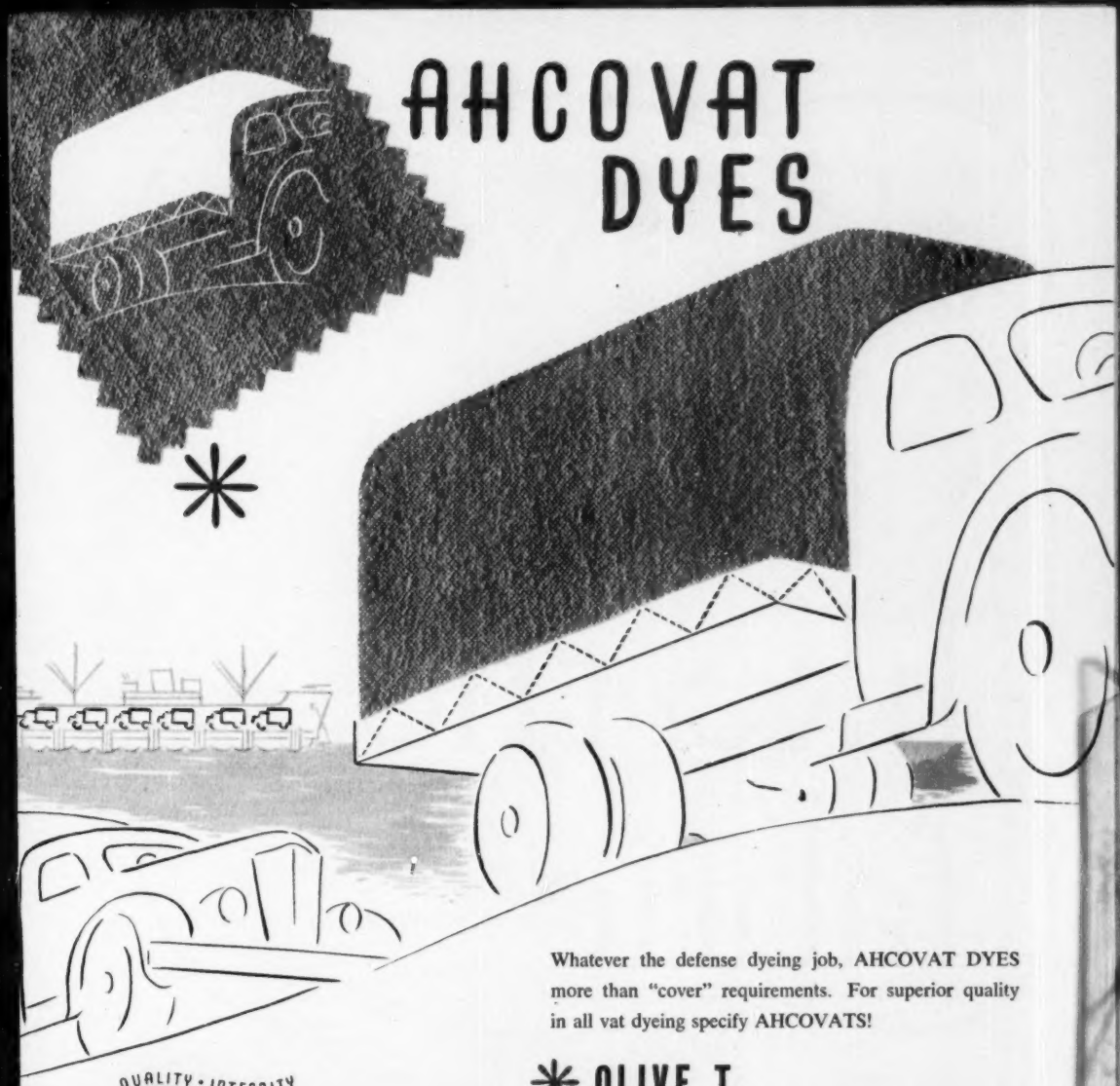

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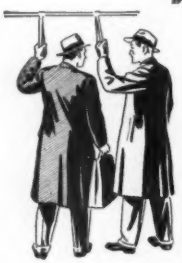

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machine until the image is on the central mark.

3. Turn the galvanometer switch to "on."
4. Turn the balance switch to "adj." and if the light image is off, adjust the image to the index mark by turning the knob above "Bal."
5. Turn the Balance switch to "Test" and turn the right handwheel to line up the index on the card carrier with the line on the plate.
6. With the Zero knob adjust the light image to fall on the central mark of the Index. The machine is now ready for test.

To perform the Fibrograph test a tuft of cotton is placed on one of a pair of combs so that approximately the same amount is distributed along the length of the comb. The comb holding the fibers is held in a bottom up position and the other comb is passed through the fibers so that a transfer of the fibers is accomplished. The fibers are evenly distributed on both combs; all the fibers of the first comb are transferred to the second comb and the process repeated. On completion of the combing process the combs are mounted on the tester and the hinged lamp holder is lowered which will throw the light image off. The position of the image is adjusted by turning the right handwheel. The pen is lowered to the Fibrograph card and the test begun.

There are two wheels on either side of the machine, one which lifts the combs and one which moves the card. These wheels are so moved that the beam of light is carefully centered on the index mark at all times. When all of the fibers have passed the scanning beam, a curve has been drawn representing the various lengths of fibers. Vertical and horizontal axes are drawn to the curve by using the handwheels of the machine.

As shown in Fig. 31, tangents are drawn to the curve from the vertical axis which, when measured, give the upper half mean and the mean length of the fibers. A uniformity ratio is calculated by dividing the mean length by the upper half mean and expressing the resulting figure in a percentage. A calculated classer's length may be obtained by use of the following equation.

$$0.2218 + (0.7916 \times \text{UHM}) = \text{calculated classers' length}$$

To accelerate the rate of calculating, a table of these classers' lengths has been prepared for use by the operator.

The Fibrograph test can be performed in twenty minutes, but it has the drawback that the percentage of fibers at various lengths can not be ascertained. However, when only the average length and the classer's length are desired, the test is adequate.

Fig. 30. The Fibrograph for testing fiber length.

The Uniformity Ratio is what its name implies, an index as to how uniform in length the fibers are. A perfectly uniform cotton would have a ratio of 100 per cent. A ratio of 70 per cent means that the fibers lack 30 per cent of being uniform. For cotton, a uniformity ratio of 80 per cent is good. Naturally, cottons with a high ratio have better spinning qualities than cottons with a low ratio.

Fiber Strength Test

There are two methods for determining the strength of fibers: the Chandler Bundle Method and the Pressley Method. The Research Division uses the Pressley Method. A description of this method will be found in the *A. S. T. M. Standards on Textile Materials* under their designation D 414-49T.

The Pressley Method uses less equipment and less time is required to perform the test. A Pressley Test can be performed in less than five minutes and when thousands of tests must be made, the time required for each test becomes very important. The Pressley Index is correlated with the Chandler Bundle test, and it is a matter of seconds to consult a prepared table to convert the index to pounds per square inch.

The Pressley machine and its equipment are shown in Fig. 32.

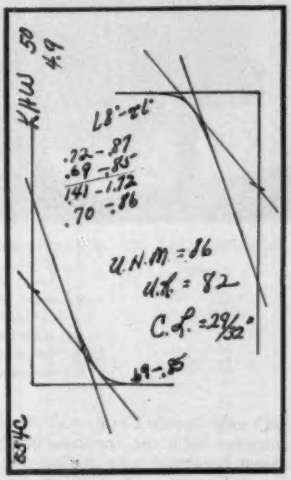


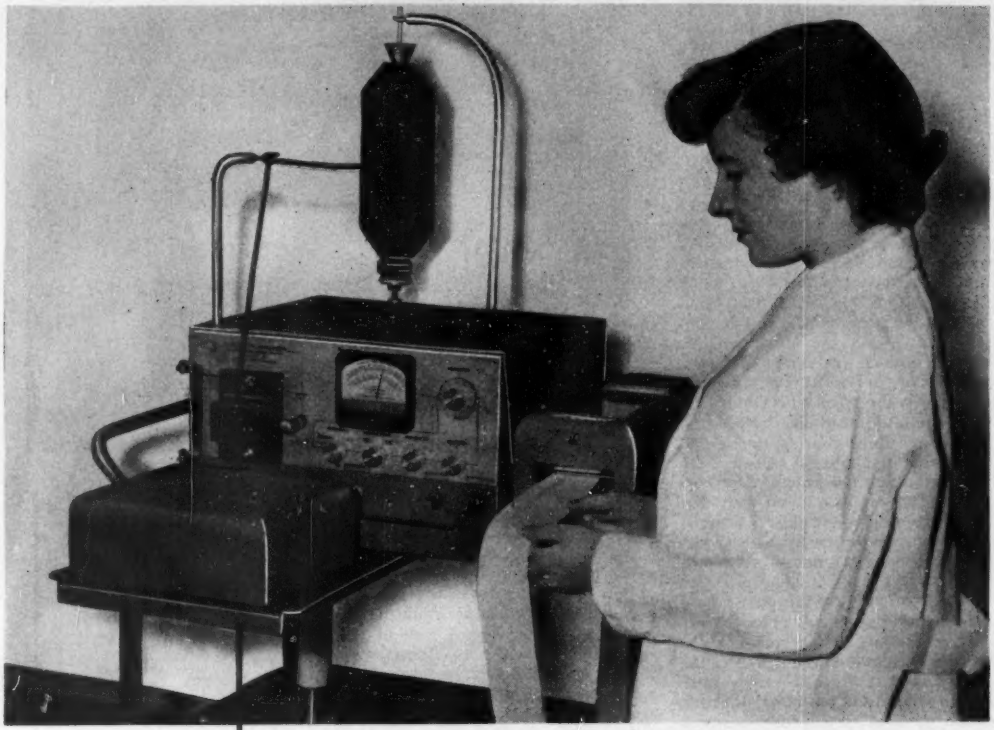
Fig. 31. Chart made by Fibrograph. Calculations were inserted by laboratory technician.

Machine: Pressley—manufactured by J. W. Doebrich, Tucson, Arizona
Capacity: 0 to 22 pounds
Calibration: Before each series of tests by the Research Division

To perform a test, a portion of the fibers is removed from the laboratory sample and the fibers made parallel by pulling and lapping with the fingers. The specimen is combed through the small comb on the vise that holds the clamps. The combing

(it's worth waiting for!)

NEW BRUSH TEXTILE UNIFORMITY ANALYZER



New Brush Uniformity Analyzer measures and records irregularities of yarn, roving, and sliver in terms of weight per unit length. As yarn passes through measuring head, wool or cotton count is shown on the meter, and a running graph is drawn by the recorder. Analyzer is calibrated for cotton or wool, as specified. It can be adapted for other materials including nylon, rayon, other plastics. Complete unit includes measuring head, amplifier, direct-inking oscillograph, yarn drive, and material handling fixtures.

Brush's new Textile Uniformity Analyzer, developed in cooperation with the Institute of Textile Technology, has been equipped with replaceable measuring heads, designed for optimum stability, and provided with a yarn evaluator using a meter presentation. The new design is reasonable in cost, and is fully backed by the Brush Service organization.

The schedule for shipment of these new units has been delayed because of scarcity of certain critical items. However, as an extremely useful and practical tool for quality control of yarn, we believe you will find the new Brush Analyzer definitely worth waiting for. Write for full information.

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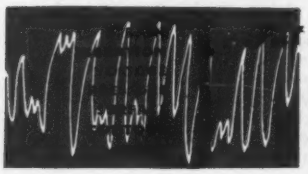

it in writing with a

BRUSH RECORDING ANALYZER

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removes the short fibers and further parallelizes the remaining fibers. A ribbon thus prepared should be about ¼ inches wide. The ribbon is held firmly between the fingers and placed in the clamp which is tightened with the aid of small set-screws in the top of the clamps. The fibers protruding on either side of the clamps are cut off with a knife especially made for this purpose, thus keeping the length of the ribbon constant. The clamps are placed in the tester where, when the lever is released, the jaws are pulled apart and the fibers broken. The carriage on the machine rolls down an incline until the fibers break; then the carriage stops and the pounds breaking strength are recorded.

The clamps are removed from the tester, and the fibers that were broken are weighed on a milligram balance having a capacity of 5 milligrams. The strength in pounds divided by the weight in milligrams gives the Pressley Index.

To secure accuracy in testing, breaks are made on a check sample of known strength before each series of tests. This check sample has been so thoroughly tested that there is no doubt concerning its strength.

Fineness

The relative measure of the diameter of fibers is known as fiber fineness. Cotton fiber fineness is ex-

CONVERSION OF THE 25% POINT TO THE CLASSERS' LENGTH

25% Point	Classers' Length	25% Point	Classers' Length
.70	11/16"	1.12	
.71		1.13	
		1.14	1"
.72		1.15	
.73		1.16	
.74	23/32"		
.75		1.17	
.76		1.18	
		1.19	1-1/32"
.77		1.20	
.78		1.21	
.79	3/4"		
.80		1.22	
.81		1.23	
		1.24	1-1/16"
.82		1.25	
.83	25/32"	1.26	
.84		1.27	
.85			
		1.28	
		1.29	1-3/32"
.86		1.30	
.87			
.88	13/16"	1.31	
.89		1.32	1-1/8"
.90		1.33	
		1.34	
.91		1.35	1-5/32"
.92	27/32"	1.36	
.93		1.37	
.94			
		1.38	
.95		1.39	
.96	7/8"	1.40	1-3/16"
.97		1.41	
.98		1.42	
		1.43	
.99		1.44	1-7/32"
1.00	29/32"	1.45	
1.01		1.46	
1.02			
		1.47	
1.03		1.48	
1.04	15/16"	1.49	1-1/4"
1.05		1.50	
1.06		1.51	
		1.52	
1.07		1.53	1-9/32"
1.08	31/32"	1.54	
1.09		1.55	
1.10			
1.11			

CONVERSION OF THE UPPER HALF MEAN TO ESTIMATED CLASSERS' LENGTH

U.H.M.	Classers' Length	U.H.M.	Classers' Length
.70		.94	
.71	25/32"	.95	31/32"
.72		.96	
.73		.97	
		.98	
.74		.99	1"
.75	13/16"	1.00	
.76		1.01	
.77			
		1.02	
.78		1.03	1-1/32"
.79	27/32"	1.04	
.80		1.05	
.81			
		1.06	
.82		1.07	1-1/16"
.83	7/8"	1.08	
.84		1.09	
.85			
		1.10	
.86		1.11	1-3/32"
.87	29/32"	1.12	
.88		1.13	
.89			
		1.14	
.90		1.15	1-1/8"
.91	15/16"	1.16	
.92		1.17	
.93			

Formulas Used in Preparing Tables

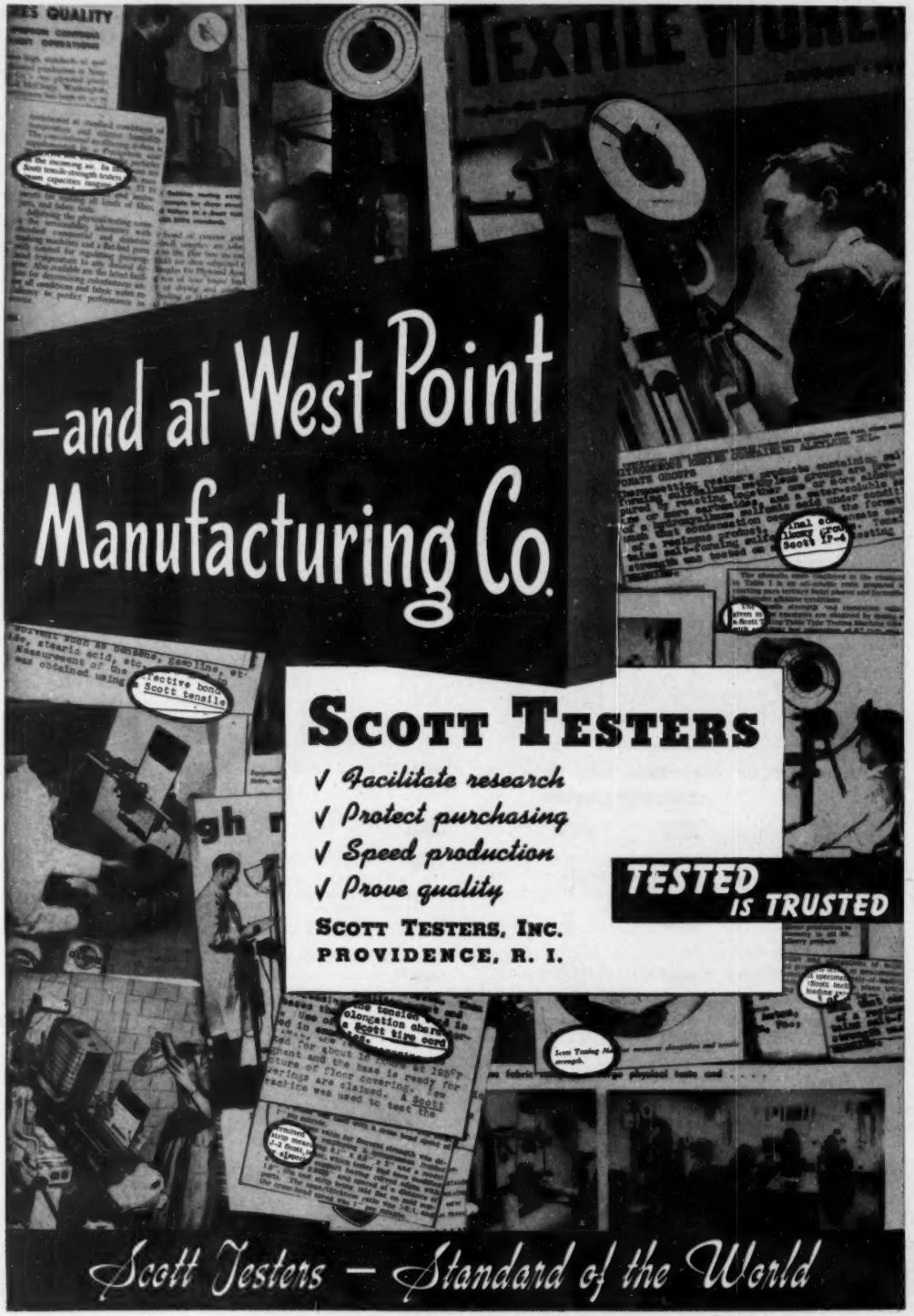
$0.2218 + (0.7916 \times \text{UHM}) = \text{Estimated Classers' Length}$

$0.1942 + (0.7090 \times 25\%\ \text{Point}) = \text{Estimated Classers' Length}$

$(10.8116 \times \text{Pressley Index}) - 0.1200 = \text{1000 pounds per square inch}$

CONVERSION OF THE PRESSLEY INDEX TO 1000 POUNDS PER SQUARE INCH

Pressley Index	1000 P.S.I.
5.42-5.51	59
5.52-5.61	60
5.62-5.69	61
5.70-5.79	62
5.80-5.87	63
5.88-5.98	64
5.99-6.06	65
6.07-6.16	66
6.17-6.24	67
6.25-6.35	68
6.36-6.43	69
6.44-6.53	70
6.54-6.61	71
6.62-6.76	72
6.77-6.80	73
6.81-6.90	74
6.91-6.98	75
6.99-7.09	76
7.10-7.17	77
7.18-7.27	78
7.28-7.35	79
7.36-7.46	80
7.47-7.54	81
7.55-7.64	82
7.65-7.72	83
7.73-7.83	84
7.84-7.91	85
7.92-8.01	86
8.02-8.09	87
8.10-8.20	88
8.21-8.28	89
8.29-8.38	90
8.39-8.46	91
8.47-8.57	92
8.58-8.65	93
8.66-8.75	94
8.76-8.83	95
8.84-8.94	96
8.95-9.03	97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pressed as micrograms (0.000001 grams), rayon as denier, and wool as microns.

Micronaire Test

Usually fineness is determined with a microscope; however, a mechanical means of determining fineness has been developed by the Research Division in conjunction with the Sheffield Corporation which eliminates considerable time and work from the test. The method uses the principle of forcing air through a sample of fibers and measuring the resistance to the flow of air, thus indirectly measuring the fineness of the fibers. The method is applicable only when average fineness is desired.

Machine: Micronaire — manufactured by the Sheffield Corporation, Dayton, Ohio.
Capacity: Cotton—2.0 to 7.0 micrograms per inch. Wool—80's to 36's grade
Calibration: Before each series of tests by the Research Division.

To check the calibration of the Micronaire, use the following procedure:

1. Check the position of the indicator by using the calibration plugs provided with the machine. There are two plugs for the cotton fibers and two for the wool fibers, giving readings both fine and coarse. The fineness is indicated on the plugs.
2. If the machine needs adjustment, use the plug which indicates the coarse fibers and open the adjusting knob at the top of the machine.
3. With a screw driver adjust the indicator 0.2 below the desired reading.
4. By using the adjusting knob move the indicator to its proper place.

To perform the test a known weight of sample (50 grains for cotton; 100 grains for wool) is fluffed to remove all matted places in the fiber, then packed into a cylinder and a steady stream of air passed through the fibers. The average fineness is read directly from the scale of the machine as shown in Fig. 33.

Microscopic Tests

The proper performance of microscopic tests requires a certain amount of training and technique which must be taught by an experienced operator. For that reason, the description of the various microscopic tests made in the Research Division will be made in general terms only to familiarize the reader with the nature of these tests. The equipment needed for these tests is shown in Fig. 34.

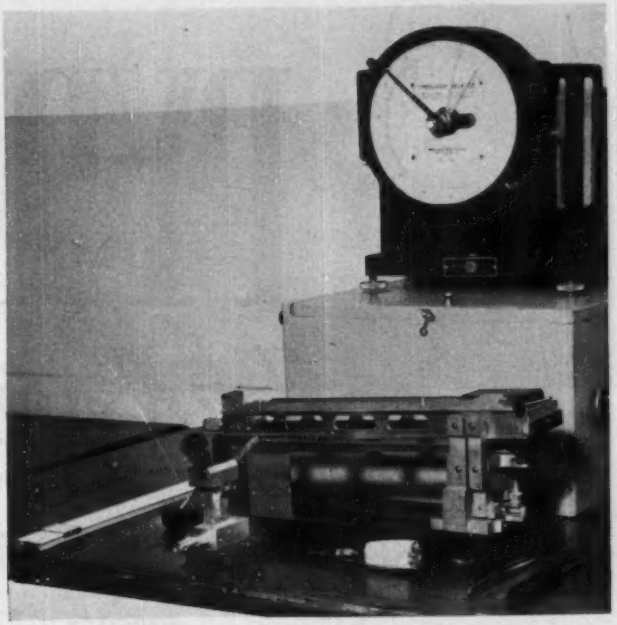
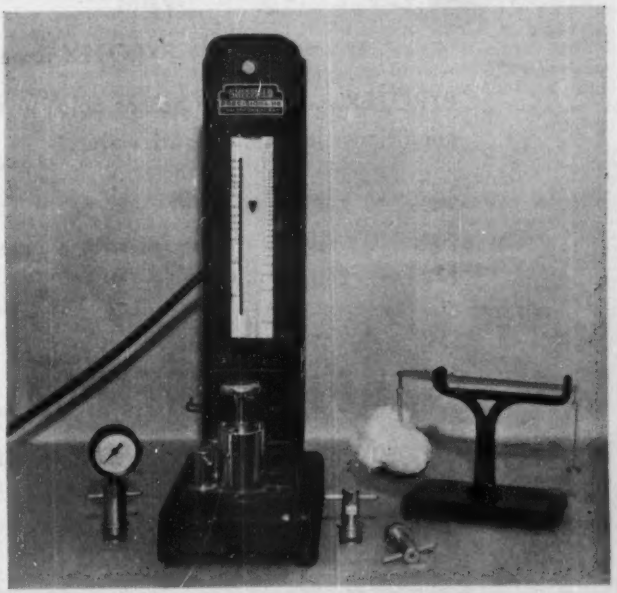


Fig. 32 (above). Equipment for testing strength of fibers.

Fig. 33 (below). The Micronaire for testing fiber fineness.



Fineness

The geometrical fineness is the average cross-sectional diameter (expressed in microns) of all the fibers of a specimen. The cross-sectional measurement of fiber fineness is increasing in use due to the development of the Hardy Cross-Sectional Method. The preparation of an acceptable cross-section requires a high degree

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of skill. A general description is given herewith:

To make a cross-section, a thin flat bundle of fibers constituting the test specimen is inserted edge on into the slot of a hand miniature microtome. These fibers are made compact by sliding the ram into the slot. The protruding edge is cut as closely as possible. Collodion is brushed over both ends. After the collodion has thoroughly dried, the fiber ends are cut flush on both sides of the microtome by using a razor blade. The plunger is swung into position and locked.

By turning the thumb screw, fibers are pushed through some 5 to 8 microns. More collodion is brushed over the protruding fibers and, after drying, both fiber and collodion are sliced off with a single stroke. This section is mounted on a glass slide wet with glycerol and a cover glass placed over the section. The diameters of the fibers are recorded and the necessary calculations made.

Another method, recommended by A.S.T.M. in their *Standards on Textile Materials* under their designation D 414-49T, is the weight fineness method. This method utilizes the fibers which have been sorted by the making of an array. One hundred fibers are counted out from each length group of the array. The fibers are weighed in micrograms and their weight recorded. From the array of data thus obtained, the mean weight fineness, variance, and coefficient of variation are calculated.

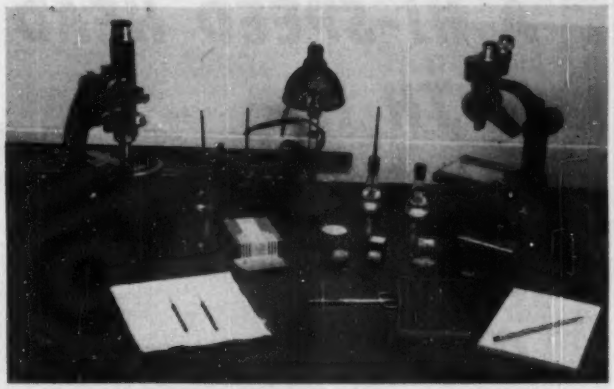

Fig. 34. Microscopic tests are conducted with this equipment.

Immaturity Test

Maturity of a cotton fiber is the degree to which the lumen has been obliterated by deposition of cellulose. Immaturity of a sample, then, is the percentage of its fibers whose thickness of wall is one half or less than the diameter of the lumen.

A test specimen consists of at least 100 fibers which are mounted on a microscopic glass slide as nearly parallel as possible. The fibers are held in place by a cover glass and flooded with an 18 per cent solution of sodium hydroxide (NaOH) by means of a pipette. The slide is placed on the mechanical stage of the microscope which is equipped with a filar micrometer.

All the fibers are checked one by one and a record kept of the immature and mature fibers. The total number of immature fibers is divided by the total number of fibers and the quotient expressed as a percentage.

Shirley Analyzer Test

The Shirley Analyzer is a machine built to separate the trash from the lint in a sample of cotton. The data obtained from these tests may be used in a variety of ways: in better selection of cottons; as a check on the

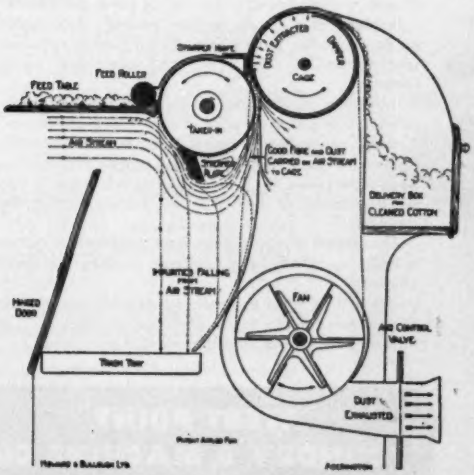

Fig. 35. The Shirley Analyzer. At right is photo of machine in laboratory. Above, sketch showing cross section and principle of operation.

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MULTI-MOTOR DRIVE AND ACCURATE CONTROL HOLD PRE-SET YARN TENSION CONSTANT AT OPERATING SPEEDS UP TO 100 YARDS PER MINUTE

The WPF&M Hi-Speed Head End is constructed throughout for heavy duty service. Gearing is simplified and eliminates frictional losses of old style clutches and speed cone drives. Drive and motors are completely covered, fully protected from lint and dirt.

Here's a Head End, equipped with Multi-Motor Drive, that accurately controls yarn stretch and tension at running speeds ranging from 20 to 100 yards per minute; a creep speed of four to six yards per minute.

In place of old style friction, an individual motor winds the beam. Individually driven slasher rolls are synchronized by the Drive and controlled by a rheostat.

Indicating meters can be quickly and accurately pre-set to any desired yarn tension. Once set, tension remains constant—all beams are wound uniformly tight—from start to finish. After proper tension has been determined for a particular grade yarn, it can be duplicated at any time by merely setting the rheostat.

Elimination of costly guesswork adjustments means a better quality finished product . . . increased loom efficiency.

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manufacturing process; and as a check of any stage within the manufacturing process.

The machine is manufactured by Howard and Bullough, Ltd., Accrington, England, and was developed by the Shirley Institute, Manchester, England. This machine may be seen in Fig. 35.

To perform a test, sample the raw stock thoroughly and allow it to condition in the atmosphere of the testing room. Then weigh out the test sample (100 grams for raw cotton and lighter wastes; 200 grams for the heavier wastes). Spread out the sample on the feed plate, loosening by hand any lumpy pieces. Be certain that the feed plate is clean. Spread the sample uniformly to cover the whole area between the guides on the feed plate.

Start the motor with the clutch out and open the fan valve. Let the machine run for two or three minutes and then throw in the clutch. With the fingers start the sample going through the feed roller. Adjust the lever so there is a minimum of lint falling with the trash. If lint is falling with the trash, then the fan valve should be opened more. If the lint delivered is too dirty, then the fan valve should be closed more.

When all of the sample has passed through the feed roll, close the valve as soon as possible. Remove any excess tufts of fibers from the tray, open the valve as before, and feed and collect the lint from such tufts in the same manner as with the original sample. Any residual trash on the feed plate should be collected and placed with the main bulk of the trash.

Remove the lint from the delivery box and rerun it, using the above procedure. Collect the trash and lint separately and weigh accurately. The calculations are made as follows:

$$\text{Per Cent Trash in the Test Sample} = \frac{B \times 100}{A}$$

$$\text{Per Cent Lint in the Test Sample} = \frac{C \times 100}{A}$$

Per Cent Cage Loss for the Sample = 100 minus the sum of above two values

Where

A = Weight of raw test sample
B = Weight of trash collected
C = Weight of lint collected

Processing Tests

After the yarn has been spun it is too late to improve the cotton fiber processing. For this reason certain tests have been designed that, if properly used, will eliminate many of the headaches in the spinning process. The more uniform the sliver and roving, the more uniform is the yarn.

Slivergraph

The Slivergraph is so designed that it measures the uniformity of the thickness of sliver or roving for continuous point to point variation. This machine may be seen in Fig. 36.

Machine: Graphic Sliver Tester manufactured by Saco-Lowell Shops, Boston, Mass.

Capacity: 0 to 0.2 inches—Cotton tester
0 to 0.18 inches—Wool Tester

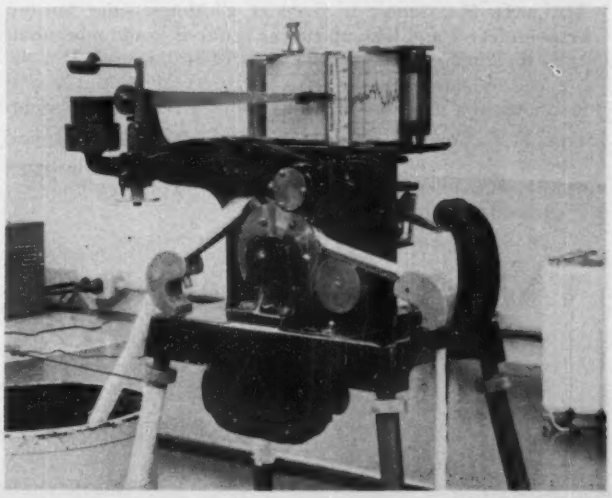
Calibration: Checked before each series of tests by the Research Division.

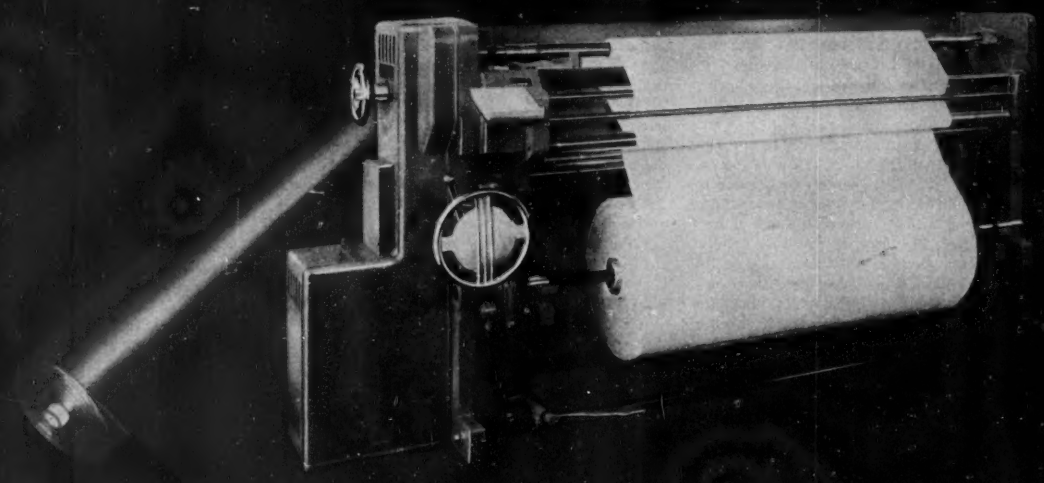
To perform the test the sliver or roving is threaded through the trumpet into the proper groove where it passes between two wheels, one of which is weighted with weights provided for this purpose. The large and small weights are used for sliver, and the large weight is used for roving. The wheel is connected by metal arms to a pen which writes on graduated paper, thus recording the up and down movements of the wheel over thick and thin places in the sliver.

At the beginning of the test the machine is set so that the pen moves equidistant on both sides of the zero line in the middle of the chart. The diameter reading thus obtained is recorded on the chart. The chart has horizontal lines representing a 0.001 inch change in the sliver thickness and vertical lines representing a foot and a yard of sliver.

The standard length of test is 30 yards. The highest and lowest point in each yard is noted and the difference between them recorded. The average for the thirty yards is taken and divided by the average diameter.

Fig. 36. The Saco-Lowell graphic sliver tester.





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This quotient is expressed as the percentage variation of the sliver. A typical graph is shown in Fig. 37.

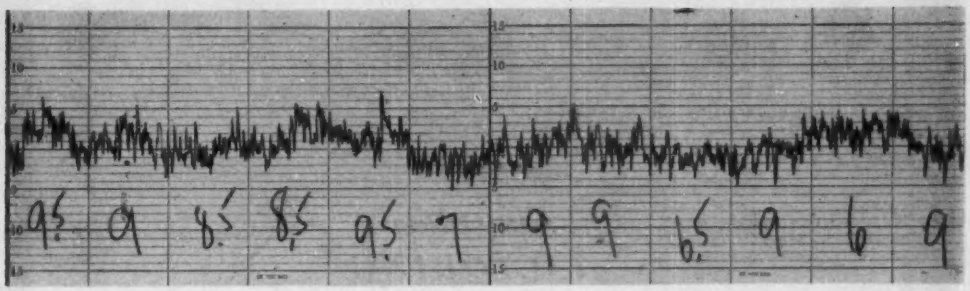


Fig. 37. A typical graph taken from a Saco-Lowell sliver tester.

Belger Roving Test

The Belger test measures the twist, evenness, and tension on roving. The graph prepared by this machine is not measured in any way but is merely a graphic presentation of the roving. The Belger Tester is shown in Fig. 38.

Machine: Belger Roving Tester available from H & B American Machine Company, Pawtucket, Rhode Island.
Capacity: 0.40 to 16.00 hank roving.

Before running a test the roving is sized—weight of 12 yards of roving divided into 100 grains. A chart on the machine tells what weights are to be used for each hank number. The machine is threaded as shown in Fig. 38. The chart has a section for full, half full, and empty bobbins. After each section of the chart has been filled, the remaining roving is run off the bobbin until the next section is reached.

In examining the chart, a graph running diagonally across the chart means that the tension on the roving frame is uneven. Even tension roving moves the graph straight across the chart. A roving with too much twist will place the graph at the top of the chart, and too little twist will place the roving graph at the bottom of the chart. A roving with too much unevenness will produce a graph occupying more than three spaces on the chart.

The Uniformity Analyzer (I. T. T. Tester)

The Uniformity Analyzer measures the cross-sectional variation in sliver, roving, and yarn. The test results are expressed as "per cent non-uniformity" or, simply, "per cent variation."

Machine: Uniformity Analyzer developed by the Institute of Textile Technology and manufactured by the Brush Development Company, Cleveland, Ohio
Capacity: Sliver, roving, and yarn in the continuous range 0.08s to 150s cotton count
Calibration: Research Division

The Uniformity Analyzer is shown in Fig. 39. The analyzer is composed of two parts—the tester and the recorder. An integrator is in the process of being perfected.

Adjustment: The procedure outlined as follows is to be used before a testing series.

1. The power and motor switches should be in the "OFF" position. Turn the "Adjust" knob to position "1."
2. Turn the "Meter-Fast-Slow" knob to "Fast."
3. At the end of a 15-minute warm-up period the needle on the Cotton Count Meter should rest on the red mark in the center of the scale. If it does not, the needle will have to be set as described under Calibration.
4. Turn the "Adjust" knob to position "2."
5. With the micrometer labeled "Meter Set" adjust the needle on the Cotton Count Meter to "Set."
6. Turn the "Adjust" knob to the "Operate" position.
7. Reset the needle on the Cotton Count Meter to "Set" if needed.

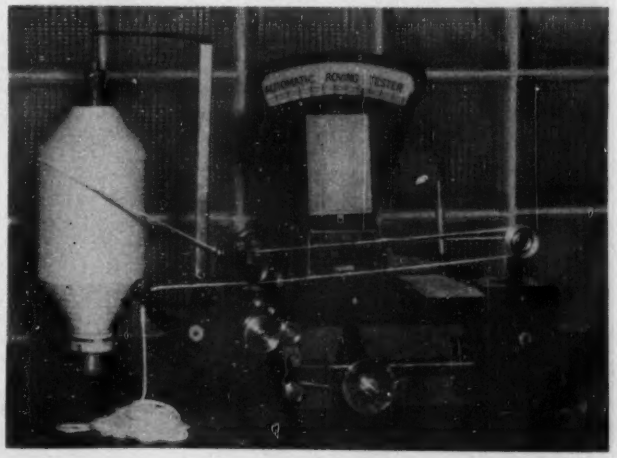
Test Run: The machine is now ready for the test run. While the machine is in the warm up period, the material to be tested may be placed in position to run. The correct slot of the measuring comb to be used is chosen from the following table:

Slot 1 (the narrowest slot)—Yarns (8s—150s)
Slot 2 (the middle slot)—heavy yarns and light roving (0.8s—8s)
Slot 3 (the widest slot)—heavy roving and sliver (0.08s—0.8s)

All the necessary support rods and guide eyelets for running yarn or roving are provided with the machine.

8. Turn the "Pen Speed" and "Pen

Fig. 38. The Belger Roving Tester.



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9. Turn the "Pen Sensitivity" switch to position "1."

10. Turn the "Motor" switch to "ON."

11. The pen on the chart should be deflected to the 5 millimeter line. If the pen is not on this line, set the pen with the "Pen Center" knob

12. Turn "Meter Set" until the Cotton Count Meter reads the nominal size of yarn being tested.

13. Advance the "Pen Center" control until the pen is centered on the recorder chart.

14. Turn the "Meter Set" control back to "Set."

15. Place the material to be tested in the proper slot and turn the motor on.

16. Turn the Recorder "ON."

The chart and material speeds may be varied but the normal speeds are as follows:

Sliver - material 6 in./sec. - chart 5 mm/sec.
Roving - material 6 in./sec. - chart 5 mm/sec.
Yarn - material 10 ft./sec. - chart 5 mm/sec.

If, after a test run, the needle on the Cotton Count Meter does not read "Set," check the measuring combs to see whether or not a small amount of cotton has been caught between the plates. This will generally be the case. The slots may be cleared by working a piece of paper back and forth between the plates. Before this is attempted, be certain that the "Adjust" switch is thrown in position "2" and that the motors are turned off.

In order to make the long cycles of variation more apparent for analysis, an averaging circuit has been built into the Analyzer as an integral part of the machine. When this circuit is in operation, the short length fluctuations in the size of the yarn are averaged out, and the chart records the running average foot for foot or yard for yard. This test is run on the same material used for the normal graph by running the material through the machine a second time. The "Pen Speed" control is set to the slow position. The setting of the control is determined by adjusting the control while the recorder is in operation. The particular setting will depend on the amount of averaging desired and the uniformity and speed of the material being tested.

Chart Evaluation: Until automatic means for evaluating the charts are developed, an arbitrary method of calculating the percentage non-uniformity is being used. The percentage calculated is the ratio of the average difference between the highest and lowest deflections to the mean deflection of the yarn on the record graph. Naturally, the lower the percentage non-uniformity the better the quality of yarn and the higher the percentage non-uniformity the poorer the yarn. The readings are made in a manner similar to the method used on the Saco-Lowell Slivergraph except that the readings are made from the base or zero line rather than the middle or average line. The chart is read and calculated in the following manner:

1. Read the highest and lowest points of the graph within each 30 successive millimeters along the graph for roving or sliver and each 10 successive millimeters along the graph for yarn. Each horizontal line on the graph has the value of one. Usually 100 readings will give an adequate precision of test. 30 successive millimeters on the graph represent 2 yards of roving and 10 successive millimeters on the graph represent 10 feet of yarn. Every second crosswise line on the roving chart will represent the necessary 30 millimeters. On the yarn chart every sixth crosswise line will represent the necessary 10 millimeters.

2. Add the high readings together and divide the sum by the number of high readings to determine the average high reading.

3. Add the low readings together and divide the sum by the number of low readings to determine the average low reading.

4. Subtract the average low reading from the average high reading to determine the average difference.

5. Take one-half the average difference and add this value to the average low reading. This is the mean reading.

6. Divide the average difference by the mean reading and multiply the result by 100 to obtain the percentage non-uniformity.

Calibration: The Analyzer is calibrated before leaving the factory and, during normal use, should not need attention. However, mishaps do occur. The perforated cover must be removed to make the calibrating potentiometer accessible.

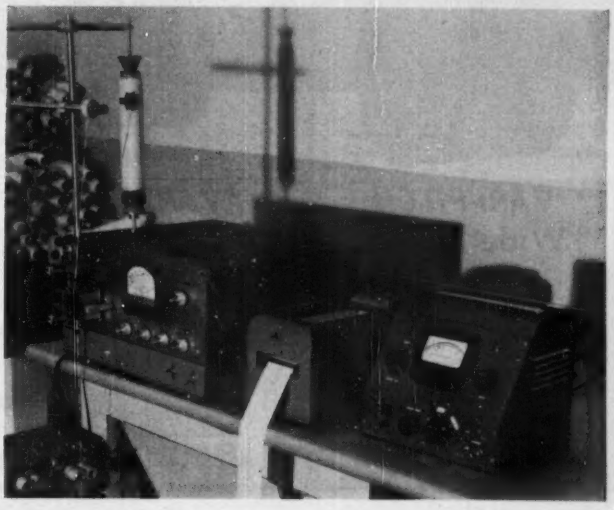
Oscillator Calibration: The oscillator controls the adjustment of the needle on the Cotton Count Meter. A warm up period of half an hour must precede this adjustment. The "Adjust" knob is turned to position "1." If the meter needle is not on the red line, either the oscillator is not properly tuned or the potentiometer is not properly set.

The oscillator tuning condenser (C-3) is found in the top left-rear corner of the instrument. The condenser has a dial calibrated from 0-10. Starting at 10, the condenser is rotated in a counter-clockwise manner. The needle should dip and then gradually rise. The correct setting is obtained when the current is approximately half way up the gradual rise and the needle is on the red line. If these two conditions can not be met, the potentiometer must be adjusted.

The potentiometer is labeled "Osc. Calibrate R-9" and is located in the top of the machine. The tuning condenser is rotated and the potentiometer is set at the same time so that the needle comes to rest on the red line of the Cotton Count Meter when the oscillator current is about half way up the rise. This calibration is checked with the Cotton Count Meter as described under Adjustment and using the calibrate yoke in the narrow yarn slot.

Pen Adjustment: Turn the "Pen Center" knob completely counter-clockwise and the "Pen Sensitivity" knob to position "1." The zero adjustment amplifier is found in the top of the machine and is labeled "R-25, Pen Zero Adjust." First, however, the pen is adjusted mechanically by removing the four-prong plug from the back of the recorder leaving the other plug connected, turning on the switch marked "Motors" and adjusting the pen so that it inks

Fig. 39. The Brush Uniformity Analyzer (I.T.T. Tester).



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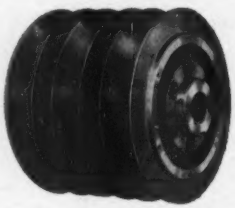

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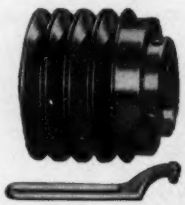

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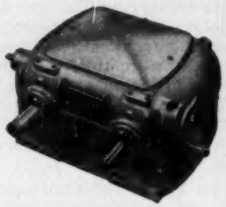

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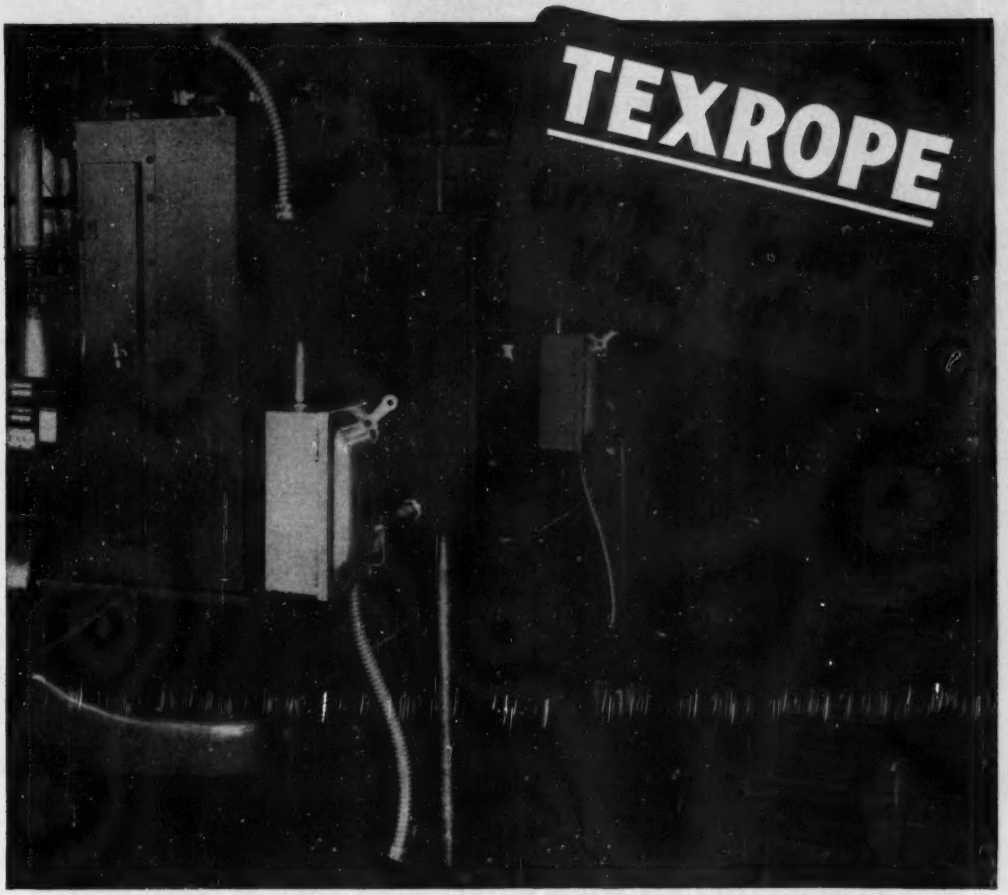

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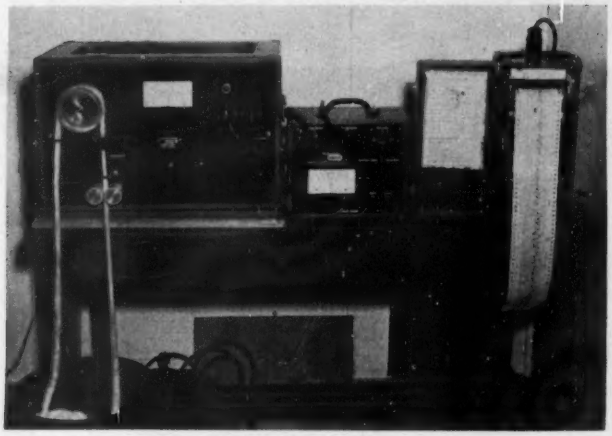

Fig. 39A. The Uster Evenness Tester.

properly exactly in the center of the paper. The "Motors" switch is turned off and the four-prong plug replaced. Turn the "Motors" switch on and adjust R-25 until the pen deflects to the 5 millimeter line. When the motors are off the pen should return to the center of the chart.

Uster Evenness Tester

The Uster Evenness Tester serves to test the variation in the cross-section of sliver, roving, and yarn.

Machine: Uster Evenness Tester—manufactured by the Uster Corporation, Charlotte, N. C.
Capacity: 1s - 150s cotton count
Slivers up to an average weight of about 88 grains
Indication of unevenness in four ranges:

± 100%, ± 50%, ± 25%, ± 12.5%

Material speeds: 1, 2, 4, or 8 yd/min.
Paper speeds: 1, 2, or 4 in./min.
Calibration: Readjustments by operator; calibration by the Uster Corporation.

The Uster Tester is composed of three parts: the tester, the integrator, and the recorder. When setting the machine for a test the operator should stand directly in front of the dials so as to introduce no bias in the zero settings.

Speeds: It is possible to run both the paper and the materials at different speeds. The speed of the material and the speed of the paper are normally as follows:

Sliver	— Material 4 yd/min	Paper — 4 in./min.
Roving	— Material 4 yd/min	Paper — 4 in./min.
Yarn	— Material 4 yd/min	Paper — 4 in./min.

Slots in the Measuring Combs: There are in the measuring combs six different slots through which the various materials may be passed. Depending on the kind of material tested, the corresponding slot mentioned in the following table is used:

Sliver	Slot 1
Coarse Roving (.70 — .90 Hk.)	Slot 2
Fine Roving, Worsted Yarn	Slot 3
Coarse Yarns (1s-7s)	Slot 4
Medium Yarns (7s-20s)	Slot 5
Fine Yarns (20s and above)	Slot 6

Inserting a New Roll of Paper: Use the following steps when inserting a new roll of paper:

1. Lift the catch lever on the left front of the recorder and detach the paper guide block by lifting it up and out.
2. Raise the leaf spring on both sides simultaneously from both ends of the roller and turn counter-clockwise.
3. Remove the empty paper tube and insert a new roll. Re-engage the leaf spring and start the paper through the guide slit so that the teeth of the roller engage in the holes of the paper.
4. Replace the guide block on the hooks and press it until the catch lever jumps in place.

Filling the Ink Trough:

1. With the tongs provided for the purpose, carefully grip the trough on the two rounded ends.
2. Withdraw the ink trough and lay it on the table with the tongs still in the trough.
3. Fill the pipette from the ink bottle and fill the trough about ⅝ full.
4. Insert the ink trough in the recorder.
5. Press the pipette tube gently on the pen point and draw up ink until the whole ink duct of the pen is blue.

The following procedure is used in performing a test:

1. The machine is turned on using the switch "Main Supply" and allowed to warm up for a minimum of 10 minutes, preferably longer if possible.
2. All stock is removed from the machine and the slots in the measuring combs are cleaned.
3. Dial No. 4 is turned to "Adjustment."
4. Dial No. 3 is turned to "100."
5. Place dial No. 2 between "4 and 6."
6. Using dial No. 1, adjust the pointer to the red line.
7. Insert the 8 yd/min change wheel set in the machine.
8. Start the stock in the machine and turn dial No. 4 to "Inert Test."
9. With dial No. 2 adjust the pointer to the zero line. If the dial does not read between 4 and 6, the wrong slot of the measuring combs is being used.

The machine is now ready for testing.

10. Switch dial No. 3 to the proper station for the material being tested: station 25 for sliver, station 50 for roving, and station 100 for yarn.
11. Turn dial No. 4 to "Normal Test" and insert the desired change wheel set.

The Integrator is next set up.

12. Turn the "Change Over Switch" to "Average Value" and press the No. 1 red knob down for a minimum of 10 seconds. The pointer on the dial should read zero on the small scale. If a chart is being made and the pointer does not read zero, the chart may be centered by adjusting dial No. 2 on the tester.
13. Turn the "Change Over Switch" back to the zero position and press the No. 2 red knob down for a minimum of 10 seconds. This clears the integrator circuits from the previous test.
14. Turn the top dial to "Recorder." The test has now begun.

The integrator gives values for 2.5-minute periods of test and should be read at these intervals. To determine the integrator reading turn the "Change Over" switch of the integrator to "Integration" and read the proper scale (25, 50, or 100%) as quickly as possible. Turn the switch to "Average Value" and read the small scale as quickly as possible.

From the table on page 155 read the correction factor as determined by the average value. Multiply the integration reading by the correction factor. This value is in turn multiplied by a constant—6—which gives the percentage mean linear unevenness. The constant 6 was obtained by dividing the integrator reading into the percentage unevenness as determined by the chart and is applicable only to this machine.

The integrator makes possible the obtaining of test results without running charts. The results, as seen above, are easily converted into percentage variation. Readings are obtained every 2.5 minutes, and a series of results may be averaged just as chart results are averaged. When excessive variations appear a chart may be made to aid in the analysis of the cause of the trouble. The integrator pays for itself in the cost savings on paper.

After the desired length of sample has been run, turn the recorder switch on the integrator to zero. The test is completed. Remove the chart

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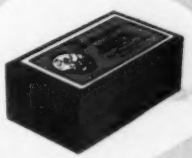

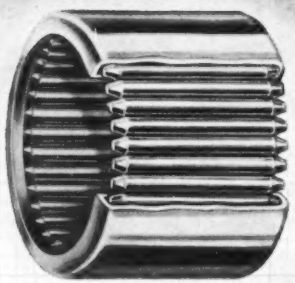

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from the recorder and read in the following manner:

Mark the high and low points in each two-yard length and record the value on the chart of the high and low points. Add these values for each two-yard length and determine the average for the test. This is the percentage variation.

The chart is supposed to be read according to the range of scale on which the test is run. However, it is more accurate and easier to read the charts on the 25% range scale and convert the average value to the proper scale. This means that each line on the chart has the value of one.

If the integrator average value reading was not zero, the average percentage variation is corrected in the same manner as the integrator reading. This means that the chart was not centered and the integrator average value reading provides for the correction. For example, suppose a reading of 50.39% was obtained from the chart but the integrator average value was + 1. Looking on the accompanying table, the factor is 0.98. Multiplying this factor by the percentage, the final reading is 49.38% variation.

Possible Trouble Spots: If any kind of trouble appears in the tester, endeavor to discover the cause by checking the following:

A. Control Lamp does not light
   1. Supply cable inserted properly
   2. Supply voltage at the connector
   3. Fuses—thermo and fine
B. Mechanism unrolling the tested materials does not work, every thing else normal
   1. Motor and condenser connections
   2. Foreign bodies in the gear
C. Paper feed of recorder does not work; check the meshing of the gears in change wheel pair.
D. The motor runs, the apparatus can not be correctly adjusted, when inserting the material to be tested the pointer gives no indication; look for defective valves and replace them.

If the foregoing procedure does not reveal the source of trouble, a service man must be called to repair the instrument.

Tracing Trouble

Since both machines produce a chart from which the length of material can be accurately determined and the paper speeds may be varied, it is possible to look for and analyze cyclic variations. For example, a defect occurring in every 3 inches of yarn would normally be found at the front rolls of the spinning frame. A defect involving many yards of yarn would be found farther back in the process. By knowing the circumference of the rolls, the draft, and calculating the inches of material delivered, considerable detective work can be done in locating trouble spots.

However, cycles must be analyzed one by one until all causes are found. A system of routine testing at the carding, drawing, and roving processes will help to prevent the production of yarn of poor quality. Enough material must be tested so that both short and long cycles will be detected. Though these testers can not solve all the problems of production, intelligent use of them will certainly help in locating many of the sources of trouble.

CORRECTION FACTORS FOR INTEGRATOR ITG L

Average Value (Reading)	± 100%	± 50%	± 25%	± 12.5%
—10	1.67	1.25	1.11	1.05
— 9	1.56	1.22	1.10	
— 8	1.47	1.19	1.09	1.04
— 7	1.39	1.16	1.08	
— 6	1.32	1.14	1.06	1.03
— 5	1.25	1.11	1.05	
— 4	1.19	1.09	1.04	1.02
— 3	1.14	1.06	1.03	
— 2	1.09	1.04	1.02	1.01
— 1	1.04	1.02	1.01	
0	1.00	1.00	1.00	1.00
+ 1	0.96	0.98	0.99	0.99
+ 2	0.92	0.96	0.98	
+ 3	0.89	0.94	0.97	0.98
+ 4	0.86	0.92	0.96	
+ 5	0.83	0.91	0.95	0.97
+ 6	0.81	0.89	0.94	
+ 7	0.78	0.88	0.93	0.96
+ 8	0.76	0.86	0.93	
+ 9	0.74	0.85	0.92	0.95
+10	0.72	0.83	0.91	

Example: Suppose an integrator reading of 8.4 on the ± 50% scale was obtained along with an average value of + 1. What would be the percentage unevenness?

Look in the table given above under the column headed 50% across from the average value + 1 to obtain the factor 0.98. Multiply the integrator reading of 8.4 by the factor to obtain the corrected reading of 8.23. Multiply this value by the constant 6 to obtain a percentage unevenness of 49.38%.

Elementary Statistical Calculations

Although the study of statistics and statistical theory is a field unto itself, there are certain simple and fundamental statistical terms in ordinary use in the laboratory. An understanding of these terms and their proper interpretation will aid in the utilization of the test results. For the student who wishes to pursue this study further, a bibliography will be furnished by the author which will guide his reading.

A great many people think of statistics as some mystic science and statisticians as "queer ducks." In thinking such as this some very helpful tools of analysis are discarded before even being tried. It is not necessary to be a statistician in order to use some of the statistical tools. These calculations are simple and anyone knowing how to add, subtract, multiply, and divide can make them.

Numbers are used constantly but

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very few people understand what is really meant by those numbers. It will be impossible to go into the philosophy of numbers here, but it will be possible to define in a small way what is meant when facts are expressed in numerical form.

Significant Figures

In arithmetical work the use of the figure 15 means exactly 15—no more or no less. But in scientific work the use of the figure 15 means approximately 15. When the speed of light is given as 186,000 miles per second, the zeros used have no significance except to locate the decimal point. But if the figure 905.45 is used, the zero is significant since it does not locate the decimal point.

Waugh in his *Elements of Statistical Method* gives the definition of significant figures as follows:

1. Every digit except zeros is always significant.
2. Zeros are always significant unless
   (a) They are at the extreme right of a number and to the left of the decimal point,
   (b) They are at the extreme left of a number.

It is possible to express the same measurement in several ways and yet have the same number of significant figures. For example, a measurement may be 425 milligrams or 0.425 grams or 0.000425 kilograms. Each of these has the same number of significant figures; namely, three. The way in which the measurement is expressed is a matter of individual choice or expediency.

Accuracy of Measurement

Most of the numbers used in the laboratory represent some kind of a measurement. The instruments used to make these measurements vary from the simplest to the most complicated and precise machines. The accuracy of a machine depends in a large part on the skill of the operator. No two people will read a machine just exactly alike.

The finest, most delicate machines have a limit of accuracy just as individuals have a limit in skill. A balance may weigh accurately to 0.1 grains. Any measurement beyond this is purely an estimate and its reliability depends entirely on the skill of the individual in estimating. Likewise, although two measurements on this balance may in averaging be carried out to the third and fourth decimal place, anything beyond the first decimal place is an estimate.

No measurement is ever entirely accurate except by chance. It is not known when a measurement is accurate even by chance. There are certain errors that tend to affect the reported result. One person may measure long, another short. The instrument used for measuring may be off. All of these affect the accuracy of the results. These errors are called biased and unbiased errors. An unbiased error will tend to cancel itself, but a biased error will continue to occur in the same direction. This is particularly true when the instrument itself is in error.

Biased error can be discovered and eliminated. Random error can never be eliminated, but it can more or less be cancelled by taking a large number of observations.

Precision in measurement enhances the value of the data. However, it is possible to overdo this matter of precision. An average of weighings taken on a balance accurate to 0.5 grains may mathematically be carried to the fourth place; but, obviously, this accuracy is mathematical—not experimental. Although it is easy to see the false accuracy in this illustration, too often the same false accuracy is ignored in other types of data.

Much time has been spent in making individual measurements extremely accurate when the total variation of the whole sample is so large that the error in individual measurements becomes of no consequence. It is far better to define a variation system by a large number of determinations than it is to have a few determinations with great refinement in accuracy.

Frequently the problem arises as to how many decimal places should be carried in calculations. It is not possible to state what should be done in each case. For example, suppose a weight is 25.5 grams. This weight could be expressed as 25,500 milligrams or 0.0255 kilograms with equal accuracy. How many decimals to use would vary in each case. Generally, however, the following rules may be used:

1. Carry the decimals of the mean one place beyond that used by individual observations.
2. Carry the standard deviation one place beyond that used by the mean or two places beyond that used by the individual observations.

Measures of Central Tendency

There are three common measures of central tendency: the mean, the mode, and the median. Of these three the one most used is the mean. The mean is better known as the arithmetic average. It is computed by making a summation of all the individual observations and dividing this summation by the number of observations. This may be expressed as follows:

$$\text{Mean} = \frac{\mathcal{E}X}{N}$$

Where
X = observations
N = number of observations
$\mathcal{E}$ = the sum of

The mode is the value that occurs most frequently. It is possible in a group of data to have no mode—that is, no value occurring more than the others—or to have more than one mode. In these respects the mode differs from the mean and the median. There is always one mean and one median; never more than one.

The median is that value at which exactly half the values lie above and half the values lie below. The median is found by taking the total number of items plus one divided by two. This gives the position of the median in the array of data. When the number of values is even, the average of the two central items is taken as the median. If the number of values is odd then the median is the value of the item which is item number $(N + 1) \div 2$ from the end.

For the most part, the measure of central tendency used in the textile laboratory will be the arithmetic mean or average. The mode and median are defined merely to show how they differ from the mean. There are other types of means not discussed here, such as the geometric, quadratic, or harmonic means. These will be so seldom used by the average technician that they will only be mentioned.

Evaluation of the Average

In practice, sampling rarely fulfills all the conditions on which mathematical formulas are based. A method has been devised whereby the accuracy of an average may be judged. The value obtained by this method is called "the standard error of the mean" and is calculated by the following equation:

$$\sigma_{\bar{x}} = \frac{\sigma_x}{\sqrt{N-1}}$$

for a sample size over 30, or

$$\sigma_{\bar{x}} = \frac{\sigma_x}{\sqrt{N}}$$

for a sample size under 30, where

σ_x = standard deviation of the items in the sample

N = number of items in the sample

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The standard error is really the estimated standard deviation of the means if similar samples were repeated. The term "standard deviation" will be explained later.

In most statistical work, three times the standard error is taken as the greatest extent to which a given result is likely to be wrong. This amounts to about one chance in 1000 of being wrong. A word of caution should be given here. The standard error can not tell whether or not the sample taken is a biased sample. All the computated standard error can tell is how closely it measures the mean of the group it represents. This caution must always be kept in mind in dealing with samples. Effort must be made to keep the sample an adequate representation of the whole.

By way of illustrating this computation, suppose a sample of yarn gave a single strand average strength of 16.84 lb with a standard deviation of 2.25 lb for 10 specimens. What is the standard error and within what limits does the true average lie?

$$\sigma_{\bar{x}} = \frac{\sigma_x}{\sqrt{N}}$$

$$\sigma_{\bar{x}} = \frac{2.25}{\sqrt{10}} = \frac{2.25}{3.16}$$

$$\sigma_{\bar{x}} = 0.71$$

$$3\sigma_{\bar{x}} = 2.13$$

The true average lies between 14.71 and 18.97 lb.

Measures of Dispersion

If there were no variation then there would be no need for statistical computations. Variation is the very essence of statistics. Because of the variation present in all data, it is necessary to know how to judge this variation and how to determine if one sample representing one population is better than another sample representing another population. The measures given in the following discussion are among the most fundamental methods of accomplishing this task. Indeed, no presentation of data is complete with only an average given. Without the measures of dispersion, how is one to know if one sample varies more than another? To present data without giving the amount of dispersion is like trying to bake bread in a stove without heat.

Range

The range in variation of a sample is obtained by subtracting the lowest value from the highest value. The range is a good rough-and-ready way to evaluate the amount of variation in the sample. No evidence is given by the range as to how the various items are dispersed, and this is its chief drawback. If this fact is forgotten, erroneous conclusions may easily be made.

However, there has been discovered a relationship between the standard deviation and the range in an unbiased sample which enables one to draw conclusions based on the range. In the accompanying table, a factor is given that, if divided into the range, will give a good estimate of the standard deviation. For small samples taken often, time can be saved using this procedure.

FACTORS USED IN ESTIMATING STANDARD DEVIATION

Sample Size	Factor	Sample Size	Factor
2	1.128	16	3.532
3	1.693	17	3.588
4	2.059	18	3.640
5	2.326	19	3.689
6	2.534	20	3.735
7	2.704	21	3.778
8	2.847	22	3.819
9	2.970	23	3.858
10	3.078	24	3.895
11	3.173	25	3.931
12	3.258	over 25	4.498
13	3.336		
14	3.407		
15	3.472		

Example: A sample of yarn has a range in breaking strength for 10 specimens of 6.92 lb. What is its estimated standard deviation?

$$\frac{6.92}{3.078} = 2.25 \text{ lb}$$

Standard Deviation

The average as such doesn't give much information concerning the variation within the sample nor does it offer much comparison of different samples. It is a well known fact that a good and a bad sample may have the same average and yet one is acceptable while the other isn't. Statisticians have developed over a period of years a method to analyze the amount of variation in a group of data. The statistic or value denoting this variability is known as the standard deviation.

This statistic is very useful to the individual analyzing data, for with it he can predict (within certain ranges) where future samples from the same population will fall. He can also determine whether or not one group of data differs significantly from another.

The standard deviation may be calculated from the equation

$$SD = \sqrt{\frac{\Sigma X^2 - \frac{(\Sigma X)^2}{N}}{N-1}}$$

where

X = individual observations
N = number of observations
Σ = the sum of

Like all mathematical problems, there is more than one way to compute the standard deviation. The equation given is the simplest to use when a calculating machine is available. The following example shows this calculation in detail.

X	X^2	X	X^2
3	9	7	49
6	36	4	16
8	64	3	9
2	4	5	25
5	25	6	36
4	16	6	36
3	9	7	49
5	25	8	64
6	36	2	4
	Total	90	512

$N = 18 \quad X^2 = 512 \quad X = 90$

$$\text{Average} = \frac{90}{18} = 5$$

Substituting in the equation

$$SD = \sqrt{\frac{\Sigma X^2 - \frac{(\Sigma X)^2}{N}}{N-1}}$$

$$SD = \sqrt{\frac{512 - \frac{(90)^2}{18}}{17}}$$

$$SD = \sqrt{\frac{512 - 450}{17}} = \sqrt{\frac{62}{17}}$$

$$SD = \sqrt{3.6470} = 1.91$$

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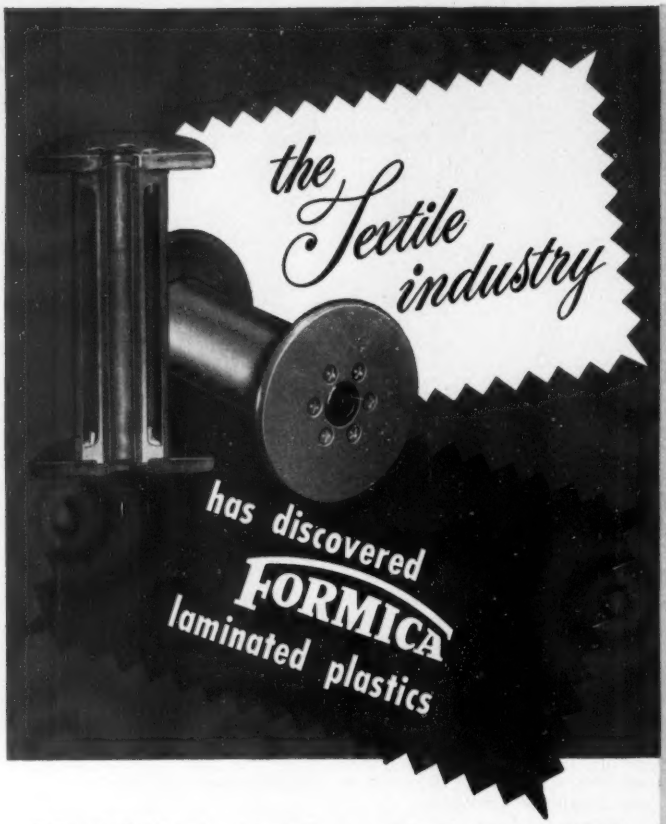

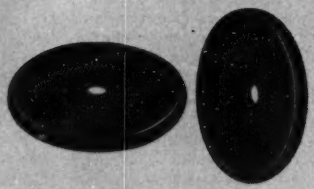

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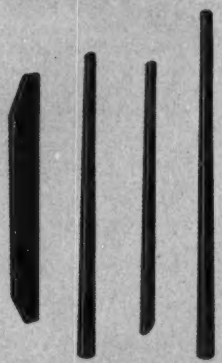

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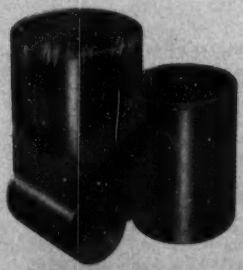

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It has been established by statisticians that when samples are taken in a random manner and the standard deviation of these is calculated, predictions can be made concerning future samples taken in the same manner. Using the average as a starting point it may be expected that approximately 70 per cent of the observations will lie within plus and minus one standard deviation from the mean, that 95 per cent of the observations will lie within plus and minus two standard deviations from the mean, and that 99 per cent of the observations will lie within plus and minus three standard deviations from the mean. Only one time in a thousand will a result fall outside these limits.

Coefficient of Variation

The term "coefficient of variation" denotes a value which is obtained when the variation within a group of data is expressed as a fraction of the average. It is the relative variation of the data. Statistically, it is the ratio of the standard deviation to the arithmetic mean and is usually expressed as a percentage.

The coefficient of variation or C.V. has certain properties which, when known and appreciated, are extremely useful in interpreting different sets of data. For example, the variation in yarn may be compared to the variation in fabrics, even though they may be measured in different units. To interpret data using the coefficient of variation the following rule of thumb may be used: The lower the coefficient of variation the less variation within the sample and the better the sample.

To calculate the coefficient of variation, divide the standard deviation by the average and express the resulting figure in percentage. Using the previous data for illustration, the coefficient of variation will be 1.91 divided by 5.00 expressed as percentage or 38.20%.

A short method of determining the coefficient of variation has been developed which utilizes the relationship of the range of the observations with the standard deviation. The range (highest value minus lowest value) is 3.078 times greater than the standard deviation when the sample size is ten. For a sample size of five the range is 2.326 times greater than the standard deviation.

The coefficient of variation is obtained by multiplying the range by the reciprocal of the values for various sample sizes and dividing by the average. The result is expressed as a percentage.

The actual test data in the accompanying box is shown in considerable detail for illustration.

DETERMINING COEFFICIENT OF VARIATION

Reciprocal for sample size of 10: $\frac{1}{3.078} = 0.32488$ or 32.5%

Reciprocal for sample size of 5: $\frac{1}{2.326} = 0.4299$ or 43%

Test Results on 8.00/7 Ply Yarn—IP-4 Tester

Break Number	Strength in lb	Break Number	Strength in lb
1	19.50	1	16.00 — low
2	19.00 — low	2	20.00
3	19.50	3	20.00
4	21.00	4	19.50
5	19.50	5	20.00
6	19.50	6	19.50
7	20.00	7	19.50
8	20.00	8	21.50
9	21.00 — high	9	24.00 — high
10	20.50	10	19.50
Average	19.95	Average	19.95

Range = 21 — 19 = 2 lb

$C.V. = \frac{2 \times 32.5\%}{19.95}$

C.V. = 3.26%

Range = 24 — 16 = 8 lb

$C.V. = \frac{8 \times 32.5\%}{19.95}$

C.V. = 13.03%

Warp Strength Results on No. 8 Wide Duck

Break Number	Strength in lb	Break Number	Strength in lb
1	342	1	349
2	344	2	365 — high
3	339 — low	3	360
4	347 — high	4	316 — low
5	341	5	325
Average	343	Average	343

Range = 347 — 339 = 8 lb

$C.V. = \frac{8 \times 43\%}{343}$

C.V. = 1.00%

Range = 365 — 316 = 49 lb

$C.V. = \frac{49 \times 43\%}{343}$

C.V. = 6.14%

Note: When figuring the coefficient of variation by the foregoing method an average range should be used for reliable results. The test results given above are only for illustrative purposes.

Machine Calibration

Every effort is made in the Research Division to have each testing machine as precise and accurate as possible. Procedures for checking and calibrating the machines have been established by the Mechanical Department in cooperation with the Testing Department. A schedule for these machine calibrations has been established and is strictly adhered to.

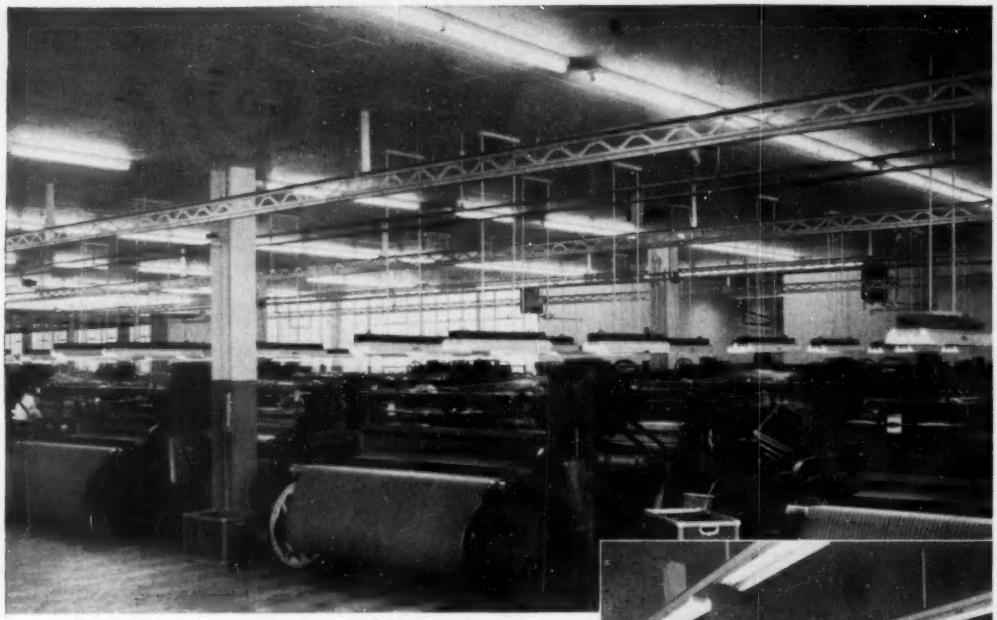
The calibration of certain small testing machines has already been discussed in preceding pages. The method of calibrating the various machines given in this section is quoted from the report made by the Mechanical Department on "Standard Practice—Verification and Care of Various Testing Machines".

Verification and Care of Model Q Scott Tensile Tester

Description of Machine

The Model Q Scott Tensile Testing machine is used to determine the breaking strength and elongation of fabrics. Two capacity ranges (0-400 and 0-800 pounds) can be obtained by adding to the pendulum the weights provided. Also, another machine has a capacity of 0-600 and 0-1500 pounds.

However, the nominal capacities stated should not be used over their entire range. The actual useful range



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of the 0-400 pound capacity is from 70 pounds to 351 pounds; the useful range of the 0-800 pound capacity is 140 to 708 pounds. The useful range of the 0-600 pound capacity is from 105 pounds to 525 pounds; the useful range of the 0-1500 pound capacity is from 261 pounds to 1306 pounds.

The pulling jaw travels at a constant rate of 12 inches, ± ½ inch, per minute. The chart ratio is 1 to 1. That is, a 1 inch separation of jaws is recorded as a 1 inch rise on the chart. A high speed set of pulleys is available on the motor to also give a jaw speed of 20, ± ½, inches per minute on each machine.

Power is supplied on the 0-400, 0-800 machine by a ¼ horsepower, 1725 rpm electric motor via V-belt drive, and on the 0-600, 0-1500 machine by a ½ horsepower 1725 rpm electric motor via V-belt drive.

The machine is equipped with the following clamps:

Scott catalog number B-2 Fabric Clamps having interchangeable upper surfaces of 1, 2, and 3-inch widths as supplied by Scott Testers.

Scott catalog number Q-7 Wedge Clamps for wire supplied by Scott Testers.

Care of Machine

1. Clean machine daily by wiping off all dust and lint using an oiled cloth over all unpainted metal surfaces. Special attention should be given to the recording mechanism. Once each two weeks the recording slide must be removed and wiped with a slightly oiled cloth. *Caution:* use a light oil because a heavy oil will prevent free movement of the pen rod in the guide and will result in a wavy curve.

2. Be careful to see that the clamps line up properly. The sides of the clamps should be in line or at least should not be prevented from lining up of their own will as test progresses, and the top surface of the bottom part of the jaws should *almost* line up. Actually the pulling jaw should be some 1/64 to 1/32 in. higher than the holding jaw. Generally speaking, it will not be necessary to check this very frequently, but each new set of jaws must be checked in this respect before it is acceptable for use.

3. Before beginning any test, and also immediately after changing from one capacity range to another, check the indicator and set it to 0. This indicator should be set to 0 with the machine in a free position. Care must be taken to see that fabric jaws with corresponding numbers are used. These numbers are on the front surfaces of each jaw.

4. A check should be made each two weeks of surface impressions of the fabric jaws. A sheet of paper comparable in size to a fabric tensile sample shall be placed in the clamps with the carbon paper over the paper at the clamping areas in such a way that impressions will be made showing both surfaces on the paper. Care should be observed in assuring proper alignment, as for regular testing, of the clamp connected with the recording head. Whenever an unsatisfactory impression is obtained in this manner, this should be called to the attention of the Mechanical Department, who will either regrind these jaws or replace them with new ones.

5. The Mechanical Department has designed and made special ball bearing rollers or wheels for the holding jaw's carriage. The rollers are quite a bit freer and easier rolling than the ones supplied with the tester originally. These rollers require no attention or lubrication, but in the event there is any sticking or binding of the carriage, the Mechanical Department should be notified and it will check this item and free it. The carriage must be free enough at all times to seek its own position with no appreciable friction losses or sluggishness.

Tensile Calibration; Dead Weight Verification (ASTM Method)

1. The dead weight verification test shall be performed once each 6 months by the Mechanical Department. All attachments and recording instruments shall be used in the test except the jaws, which must be removed in order to install the calibration apparatus.

Dial readings will be taken at 20 or 50-pound increments throughout the useful load range of the machine, and a verification sheet showing the pounds error and the percentage error will be submitted to the Testing Department after each test. The tolerance or allowable error on this machine is ± 1%; if the error is greater than this, repairs must be made on the machine and the dead weight test repeated.

2. Each six months at the time of the dead weight verification the Mechanical Department will remove and clean the 4 ball bearings located in the head of the machine. Two of these ball bearings are on the pointer shaft and two on the pendulum shaft. These ball bearings will be cleaned with benzene or a similar solvent and will be lubricated with a good grade of white vaseline.

A check should be made at this time to be sure that the ball bearings are free of any dirt, lint, or imperfections. These can be readily detected by the ease with which the ball bearing turns. If new ball bearings are needed they will be replaced at this time before dead weight calibration proceeds.

3. The testing apparatus should be attached to the machine to fit the pulling carriage and connected to the holding carriage. The apparatus shall be checked to see that all points are free and not touching or binding on the frame of the machine, and that all parts are level.

4. Dead weight loading shall be added in increments of from 20 to 50 pounds throughout the useful range of the machine, and these weights shall be added in an ascending manner; and after adding the weights the pendulum shall be gently oscillated in order to average out what little friction loss there is in the mechanism.

5. Throughout the test be cautious and watch for any friction losses or rubbing which might affect the accuracy of the machine.

6. The allowable error is ± 1% and should the error be greater than this, correction shall be made and the dead weight test repeated.

7. After this test has been performed on the lower range of the machine, the weights shall be removed from the testing apparatus and the additional weights added to the pendulum in order to increase the capacity of the machine and then the same test repeated for the high load range.

8. Once each 2 years the dead weights shall be checked and certified by the Alabama Bureau of Weights and Measures against a National Bureau of Standards standard weight.

Wire Test

1. This test is to be made each two weeks by the operator for purposes of verification of the machine. This is not a recognized calibration test, but it will serve to check the consistency of the machine between the semi-yearly calibration tests. Wires used for this test shall be Brown & Sharpe gauges number 6, 8, 10, 12, 14, and 16 bare soft copper wire.

2. This wire shall have been previously checked and calibrated by the Mechanical Department and cut to the desired length. When making this test use the Q-7 Wedge clamps for wire, with 10 inches between jaws.

3. A minimum of 5 tests shall be made on wire of each gauge and tensile results of each test shall be recorded.

Elongation Calibration; Verification

This test shall be made once each 6 months by the Mechanical Department, preferably at the same time that the tensile calibration tests are made.

The jaws of the testing machine shall be in their normal position for the starting of a test and the chart or pen adjusted so that the pen indicates 0 load and 0 elongation.

Using the inside calipers or dividers, measure the distance between the butts of the jaws to the nearest 0.01 inch. This distance should be designated as "A" (normal jaw distance). The machine shall be operated without a specimen until the pen indicates approximately 1 inch elongation, and the distance between the jaws should be measured to the nearest 0.01 inch. This distance should be equal to the distance "A" plus the elongation as recorded on the chart. This operation shall be repeated with elongations corresponding to approximately 2 and 3 inches.

Error in Chart

Any discrepancy between the recorded elongation and the actual increased distance between the clamps is an error in the recorded elongation caused by faulty spacing of the

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chart elongation graduations.

To establish errors in recorded elongation, a chart should be placed in the testing machine and adjusted properly; clamps shall be returned to their initial position. Then a load is applied without permitting separation of the jaws by gripping a non-extensible member such as a strip of thin phosphor bronze or steel in both clamps. The machine shall be operated so the pen draws a line on the chart.

Caution: turn the driven pulley by hand; do not use the motor. This line should be parallel with the axis, indicating variable error in the elongation due to the use of incorrect angle in printing charts or to lines indicating a designated elongation not being straight lined.

Error in Machine

Failure of the pen line to parallel the axis of the chart when a non-extensible member is placed between the clamps according to procedure given may be due to improper geometry of the testing machine; in other words, some of the parts may not be properly located, or of the proper dimensions.

Failure of chart, pen, and clamps to start moving at the same time causes poor coordination of movement and is indicated by a changing error in the recorded elongation when calculated on a percentage basis.

Verification and Care of Model J-2 Scott Tester

Description

The model J-2 Scott Tensile Testing machine is used to determine the strength and elongation of yarn and fabrics. Two capacity ranges, 0-250 and 0-500 pounds, can be obtained by changing the pendulum weight. However, in actual practice this machine should not be used for this full range.

The 0-250 pound range should be used for breaks between 38 pounds and 191 pounds, and the 0-500 pound range should be used for breaks between 77 pounds and 384 pounds.

The lower jaw travels at a constant rate of 12 inches, plus or minus ½ inch, per minute. Power is supplied by a ¼ horse power 1725 rpm electric motor V-belt drive.

The machine is equipped with the following clamps or jaws: yarn spools for skein breaks; holding jaws for fabric with 1, 2, and 3-inch anvils; and American Jute Association clamps for wire or cord, all supplied by Scott Testers, Inc.

Care of Machine

1. Clean machine daily by wiping off all dust and lint, using an oiled cloth over all unpainted metal surfaces. Special attention should be given to the recording mechanism, its working parts, and its guide.

2. Care should be taken when installing jaws to see that jaws with corresponding identifying numbers are used and that these jaws are lined up properly. The identifying numbers for these jaws may be found on the front surfaces of each jaw.

3. Each month a check should be made of surface impressions of the fabric jaws, using a 1 inch anvil. A sheet of paper comparable in size to a fabric test sample should be placed in the jaws with carbon paper over the clamping areas in such a manner that impressions will be made showing both surfaces on the paper. As soon as appreciable wear is detected by this test, the surfaces of the jaws should be reground or replaced with new jaws.

4. Care should be taken before each test to see that the pointer is set to 0 on the scale. *Notice*, this check should be made before each series of tests and also after adding or removing the auxiliary weight on the pendulum to convert to or from the 0-250 pound scale.

5. The correct distance between jaws for fabric testing is 3 inches and the correct distance between spools (center to center) for the skein break test is approximately 20 to 24 inches.

6. The gear box should be lubricated once each month with a good grade of SEA 30 oil or equivalent. Care should be taken not to get too much oil on the clutch surfaces.

Tensile Calibration; ASTM Dead Weight Test

1. The dead weight test shall be performed once each six months by the Mechanical Department. All attachments and recording mechanism shall be used in the test, including the fabric jaws. Dial readings at each 20 to 50-pound load increment shall be noted and recorded and the pounds error and percentage error calculated for each reading. These readings must check with the dead weights within plus or minus 1% as per the ASTM standard for this machine.

2. Remove the head spindle bearings and check them before making the dead weight tests. Clean them with benzene or some similar solvent and when thoroughly dry they should be lubricated with a small amount of white vaseline or light grease. Before replacing ball bearings check to see that they turn freely and do not have any dirt or tight spots in them. If they are faulty, replace with new ones. At this time also lubricate the gear reduction box with a light grade of non-fibrous grease.

3. In order to make the dead weight calibrations, add the weight hanger arm and hangers and add the counter-balancing weight to the pointer shaft in addition to the small counter weight which is used with the jaws, and set the pointer to 0. Then add the calibration weights in successive steps, being careful to keep them very nearly balanced and seeing that the weight bar and hangers do not touch or rub the machine in any way. At each reading gently oscillate the pendulum up and down and let it come to rest before taking the reading. All checks must be made in an ascending order as specified by ASTM.

4. An examination should be made to detect any friction or slack in the weighing, indicating, or recording mechanism. Also check the machine to see that it is level and plumb. Make this check on the vertical lead screw.

5. After the test has been made on the 0-250 pound capacity, add the pendulum weight and repeat the tests on the 0-500 pound capacity.

6. The tolerance is plus and minus 1% and should the error be greater than this, correction should be made and the dead weight test repeated.

Wire Test

1. This test will be made each two weeks by the operator for purposes of verification of the machine. This is not a recognized calibration test, but it will serve to check the consistency of the machine between the semi-yearly calibration tests. Wires used for this test should be Brown and Sharpe gauges number 10, 12, 14, and 16 bare soft copper wire.

2. This wire shall have been previously checked and calibrated by the Mechanical Department and cut to the desired length. When making this test use the American Jute Association jaws with 10 inches between grips.

3. A minimum of 5 tests shall be made on wire of each gauge, and the tensile strength results of each test shall be recorded for reference.

Elongation Calibration; Verification

This test shall be made once each 6 months by the Mechanical Department, preferably at the same time that the tensile calibration tests are made.

The jaws of the testing machine shall be in their normal positions for the start of a test and the chart or pen adjusted so that the pen indicates 0 load and 0 elongation.

Using calipers or dividers measure the distance between the butts of the jaws to the nearest 0.01 inch. This distance should be designated as "A" (normal jaw distance). The machine shall be operated without a specimen until the pen indicates approximately 1 inch elongation, and the distance between the jaws should be measured to the nearest 0.01 inch. This distance should be equal to distance "A" plus ½ of the elongation recorded on the chart. This operation shall be repeated with elongations corresponding to approximately 2 and 3 inches.

Error in Chart

Any discrepancy between the recorded elongation and the actual increase in distance between the clamp is an error in recorded elongation caused by faulty spacing of the chart elongation graduations.

To establish errors in recorded elongation, a chart shall be placed in the testing machine and adjusted properly. The clamps shall be returned to their initial positions and a load applied without permitting separation of the clamps by gripping a non-extensible member such as a strip of thin phosphor bronze or steel in both clamps. The machine shall be operated so that the pen draws a line on the chart.

Caution: turn the driven pulley by hand; do not use the motor. This line should be parallel with the axis and indicating variable load and 0 elonga-

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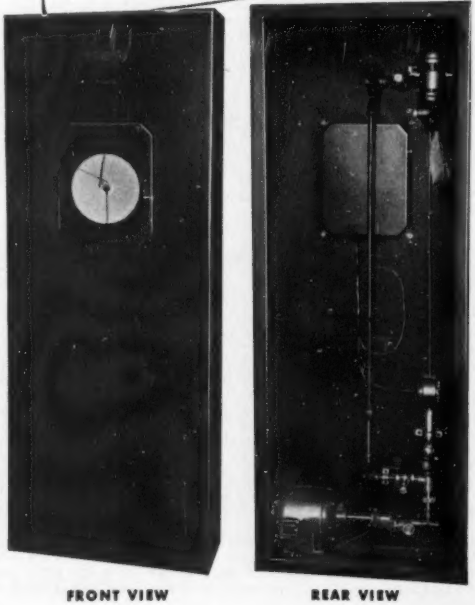

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tion. Failure of the pen line to parallel the axis of the chart indicates a variable error in the elongation due to the use of incorrect angle in printing charts or to lines indicating a designated elongation not being straight lined.

Error in Machine

Failure of the pen line to parallel the axis of the chart when a non-extensible member is placed between the clamps according to procedure given previously, may be due to improper geometry of the testing machine. In other words, some of the parts may not be properly located or have the proper dimensions.

Failure of chart, pen, and clamps to start moving at the same time causes poor coordination in movement and is indicated by a changing error in the recorded elongation when calculated on a percentage basis. This may be caused by loose or worn parts.

Verification and Care of Randall & Stiekney Gauge

Description

The Randall and Stickney thickness gauge is used for measuring the thickness of textile materials. Two types of these gauges are available in the laboratory. The first gauge used on the majority of work is the dead weight type equipped with a dial graduated to read directly to .001 inches. The presser foot shall be circular in diameter with a diameter of .375 ± .001 inch. The presser foot and moving parts connected therewith shall be weighted so as to give a total load of 6 ± .1 ounces (equivalent to a pressure of 3.4 psi) to the specimen. The presser foot and anvil surfaces shall be plane to within .0001 inches and parallel to each other within .0001 inches.

The second thickness gauge is the same in every respect as the other gauge except that it has a .500 ± .001 inch diameter foot.

Zero Adjustment

The gauge is adjusted to zero by releasing two thumb screws located directly below the anvil. Push down on the anvil until the pointer falls to the left of zero, then turn the thumb screw directly below the anvil and slowly adjust the pointer back to zero; lock in this position by means of the thumb screw on the side of the anvil support shaft.

Parallelism of Presser Foot and Anvil

It is very important that the presser foot be parallel with the anvil against which the cloth is placed. When the presser foot does not rest absolutely flat and evenly on this base, accurate readings cannot be made. This should be checked periodically by the Testing Department while the gauge is in use by means of placing a cigarette paper around the edges of the presser foot. Any variation in reading shows that the gauge is out of parallel.

In the calibration of the instrument the Mechanical Department will adjust or machine the presser foot until this reading is within .0001 inch when checked with a certified set of Hoke gauge blocks.

Care of Instruments

The presser foot shaft shall be cleaned with gasoline or other solvent periodically and oiled with a light machine oil in order to assure that this shaft operates freely. Too heavy an oil or dirt on this shaft will cause a high gauge reading.

Verification nd Care of IP-Type Scott Tensile Tester

Description of Machine

The IP testing machines, made by Scott Testers, Inc., operate on the inclined plane principle (therefore the name IP). The force to break the yarn is obtained from the weight of the carriage rolling on an inclined plane. The angle of inclination is varied to vary the load on the specimen.

From elementary trigonometry:

Where: Θ = angle of inclination measured from horizontal

W = Weight of carriage

The force (F) applied to the yarn is obtained by the equation $F = W \sin \Theta$.

The essential parts of the inclined plane machine are the carriage and the track on which it runs. The specimen to be tested is clamped in a fixed clamp, on the upper end of the machine, and to a clamp mounted on the carriage. The angle the track makes with the horizontal is varied by lowering one end of the track at a constant rate. The machine automatically records a load-elongation chart in rectangular coordinates. The load, recorded as ordinate, is approximately proportional to the vertical distance moved by the plane; and the elongation, recorded as the abscissa, equals the distance the carriage moves along the track.

There are several types of these machines, the IP-2 which has a capacity of 2000 grams, the IP-4 which has a capacity of 50 lb. These two models are the only ones that are to be considered here.

The track, or plane, on the IP-4 model travels through an arc of 30 degrees and as shown above:

$$F = W \sin \Theta$$

and $F = W \sin 30° = W(0.5)$ or $\frac{W}{2}$

Therefore $F = \frac{W}{2}$

The track on the IP-2 model moves through an arc of 25 degrees; therefore:

$$F = W \sin \Theta = \sin 25°$$

$$F = W(0.42262)$$

Looking over the calculations with regard to the mass of the carriage for the IP-4 machine, the gross weight of the carriage is two times the full chart reading, while for the IP-2 model the mass of the carriage is 2.3664 times the full chart reading. This data does not take into consideration the friction in the machine. Rough, uneven tracks, worn wheels, worn or dirty bearings, etc., which cause increased friction will show up in the check made before calibration.

Care of Machine

1. Clean machine daily by wiping off all dust and lint, using an oiled cloth on unpainted metal surfaces. Special attention should be given to the chart mechanism. Once each two weeks the slide should be removed and wiped with an oiled cloth. *Caution*, use a *light oil* so that the slide will move freely.
2. The machine is equipped with ball bearing wheels which should require attention only when the six months calibration is made. Should the wheels seem to need attention the Mechanical Department should be notified.
3. Once each two weeks all transmissions and gear boxes should be checked to make sure that the oil level is at the proper height and that the proper amount of grease is in the box.

Tensile Calibration

1. A verification test will be made once each six months by the Mechanical Department. A verification sheet shall be submitted to the Testing Department showing the weight of carriage, time of application for full load, and percentage of friction losses, which must be less than two per cent of the capacity.
2. At the time of the six months calibration the ball bearings in the wheels on the IP-4 will be cleaned with benzene or like solvent. The bearings will be checked to see that they are in good condition; if they aren't in good condition they will be replaced. These bearings should be lubricated with a small amount of white vaseline, when the bearing is completely dry of solvent.

The rails should be inspected for nicks, waviness, etc.; if small nicks are evidenced a hone should be used to smooth the nicks out. The wheels on the carriage should be inspected and the wheel rails cleaned and oiled with a light oil. Gear box and transmission should be inspected to see that they are in satisfactory condition and that they contain the proper amount of oil and grease.

3. After this thorough inspection, check the time of application of full load. The time of application for the IP-4 is 20 seconds and for the IP-2, 60 seconds. Timing should be checked while the track or plane is moving from the horizontal and not during the recovery stroke.
4. To check the friction on the machine, either model, place the carriage on the track so that the pen is approximately in the center of the chart. This done, start the machine so that a curve is given on the chart. The curve should break away from the vertical and move toward a horizontal movement within two per cent of the chart reading. This breakaway in less than two per cent will indicate friction losses of less than two per cent, which is the allowable tolerance.

If the breakaway is not within the limit of 2% the track wheels should be rechecked for nicks or dirty spots; at this time a check should also be made to see that the chart slide is free of dirt and that it is oiled and is operating properly.

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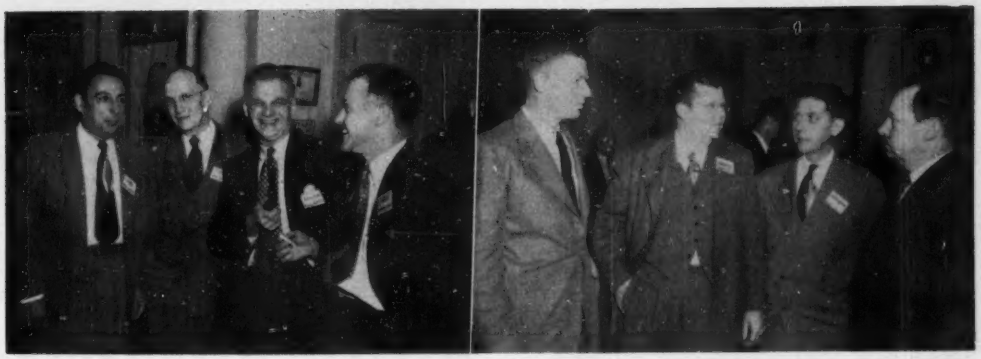

AMONG THOSE ATTENDING were (from left to right). **Louis A. Fiori,** Southern Regional Research Laboratory; **P. Theel** and **J. E. Turcotte,** Philadelphia Textile Institute; **W. Charles Knight,** Textile Department, Alabama Polytechnic Institute; **F. H. Martin,** Springs Cotton Mills; **P. W. Woodruff,** Erwin Mills, Inc.; **George E. Archer,** Uster Corp.; **Clyde E. Moss,** Firestone Textiles, Gastonia, N. C. Morning and afternoon sessions were held.

Second Cotton Research Clinic

Staff Report

MORE than 100 research minded men from public and private textile research laboratories and mills in 17 states and Canada, met in Pinehurst, N. C., for a five-session meeting spread over Feb. 7-8-9. The meeting, known as the Cotton Research Clinic, is an annual affair sponsored by the National Cotton Council of America. The first clinic was held last year. Projects discussed at these meetings are designed to be of value to all interested in cotton, from the breeder, through the manufacturer, to the ultimate consumer.

The first session had as its theme, "Mechanical Processing of Cotton," and included three papers, one on "The SRRL Type Cotton Opener," by Ralph Rusca, of the Cotton Mechanical Processing Division, Southern Regional Research Laboratory, New Orleans, La.; a second on "Evaluation of Cotton Cleaning in Mills," by Robert O. Simmons, asst. supt., Pepperell Manufacturing Co., Lindale, Ga.; and a report on the progress of the Inter-Industry Ginning-Spinning Test, by Burt Johnson, of the National Cotton Council, Memphis, Tenn. The first two of these papers were classed as restricted and the data presented were withheld from publication. However, TEXTILE INDUSTRIES published considerable data on the SRRL Cotton Opener in the October 1950 issue, page 87, and it is understood that this later data will be made available in the near future.

Fiber Structure. The second session of the Clinic took up the question of "Cotton Fiber Structure," and Lyman Fourt, Harris Research Laboratories, presented the first paper, "Luster in Cotton—Influence of Shape and Fine Structure." Mr. Fourt first explained the method and equipment used in his experiments to determine fiber luster. A beam of light is directed onto an area of yarn wound closely on a board. The reflection of light from this yarn is then measured with a photo-electric cell. The amount of light reflected from the yarn when the light beam is directed against the yarn at a 45 deg. angle and the amount reflected when the light beam is directed at a 0 deg. angle are set up as a ratio, known as the contrast ratio, and this is used as a measure of luster.

Using contrast ratio as a measure of luster, Mr. Fourt's experiments indicated a direct relationship between upper half mean length of the fiber and luster. He found a similar relationship between fiber strength and luster. He did not find any correlation between surface area and luster. To the breeder this means that to breed for luster, he should breed for fiber length and strength. To the purchaser of cotton who wants cotton with luster, this means that he should purchase by staple and fiber strength. And, according to these findings, surface area or fineness, is not a determinant.

These experiments also indicated that there is considerable difference in luster of the same cotton if the order of kier boiling and mercerizing is reversed. Kier boiling and then mercerizing produces a much more lusterous product than mercerizing and then kier boiling.

JULIAN JACOBS of the Textile Research Institute has an informal discussion with **J. K. Phillips** of Goodyear Tire and Rubber Co. Others (left to right): **Murphy Cook,** U. S. Department of Agriculture, Clemson, S. C.; **Thomas Kerr,** U. S. Department of Agriculture, Beltsville, Md.; **Helmut Wakeham,** Textile Research Institute; **Norman C. Armitage,** Deering-Milliken Research Trust, Pendleton, S. C.; and **George S. Buck,** National Cotton Council.

Helmut Wakeham of the Textile Research Institute, Princeton, N. J., gave, as the second paper of the session, the results of an investigation of strength and weakness of cotton based on single fiber studies. Photomicrographs which he showed clearly demonstrated reversals of structure in cotton fibers. These microscopic photographs were made with polarized light, and they showed definite points along the length of the fiber where the structure changed from S to Z in "twist." Studies showed that these reversals were of such frequency that if their strength were the same as the remainder of the fiber, breakage might be expected, by pure chance, to occur at these points about 10-15% of the time. On the other hand, in actual tests, the fibers broke at these points about 35-47% of the time. This indicates that these points of reversal are actually much weaker than the remainder of the fiber. Dr. Wakeham suggested that it might be crystalline structure at these points which accounts for their weakness, and he went on to substantiate this point by showing that when the fibers were treated with 18% NaOH, which would decrease the crystallinity, the breaks occurred at reversals only to the degree which might be expected by pure chance; this is a new explanation of the increased strength of yarn when mercerized.

Dr. Hugh Brown, dean of the School of Textiles, Clemson College, suggested, in the discussion following the paper, that instead of a change in crystalline structure, the treatment with NaOH might merely straighten out the kinks, and assuming that the reversals come at kinks (as evidence indicates) this treatment might reduce the tendency to shear which is inherent in any angular design subjected to stress. Dr. Brown suggested, in other words, that it was a property of fiber design in a mechanical sense which might account for breakage at reversals rather than crystallinity.

The final paper of this second session was on "Relationship of Crystallinity to Physical and Chemical Properties of Cotton," and it was presented by Kyle Ward, head, Cotton Fiber Division, Southern Regional Research Laboratory. Dr. Ward gave a very clear description of the molecular structure of the cellulose in the cotton fiber. He compared the molecular structure to the structure of the fibers in yarn. He stated that he had found that the orientation of the molecules was the primary factor in determining the fiber strength. Similarly, he found elongation of fibers most influenced by the crystallinity of the molecular length, another impor- of the fiber most influenced by a factor which he called molecular porosity or disorder.

He then discussed the effect which overdrying at the gins has on each of the factors, and on molecule length, another important characteristic of the celulose molecule. Dr. Ward was careful to point out that he was not presenting known results of experiments but was suggesting subjects for study.

Discussion of this paper suggested that some of the characteristics of overdried cotton, particularly brittleness, might be the result of overheating the wax, or benzene soluble material, on the cotton rather than any degradation of the cellulose itself.

Measurement of Cotton Fiber Properties. The third session of the Clinic was opened with a paper by Kenneth Hertel, head, Fiber Laboratory, University of Tennessee, on "Measurement of Maturity and Fineness with the Arealometer." This instrument (see page 205, TEXTILE INDUSTRIES, Feb., 1951) is designed to measure fiber immaturity by determining its flatness. This flatness or ellipticity is determined by recording a sample's resistance to air flow at two different degrees of compression.

In a series of experiments using this instrument, Dr. Hertel has found several interesting relationships which he has expressed in a graph. Specific area of a fiber, which is the external surface per unit volume, is plotted against the immaturity ratio, which is the area of a fiber cross-section divided by the area of the wall portion of this cross-section, and this gives an array of fiber cross-sections which varies only in size along the vertical axis and in shape along the horizontal axis. From this chart it is possible to determine fiber perimeter and weight per inch for the idealized fiber. In other words, it seems to Dr. Hertel that there is a relationship between certain physi-

(*Continued on page 231*)

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EXCLUSIVE

The articles appearing in this department, like those in the feature section on which this symbol appears, were prepared exclusively for TEXTILE INDUSTRIES.

Is the Overseer A Forgotten Man?

EDITOR TEXTILE INDUSTRIES:

I have read with considerable interest recent press reports that a well known automobile manufacturer is taking steps to give the foremen a greater part in the management of company affairs. Conferences are being held, and both top company officials and foremen participate, resulting in an exchange of information heretofore impossible. Along with the increased responsibility, the foremen are getting more comfortable offices, special parking places, private lunch rooms and other facilities to enable them to do a better job and increase their prestige.

Maybe the average cotton mill couldn't go to all this expense to improve the lot of the overseer and the secondhand. I am firmly of the opinion that some things could be done, at very little cost, that would not only raise the prestige of the overseer in the eyes of his fellow employees and of the community, but would make him a better manager of his department. The results would be evident in more production, lower cost, less waste, lower labor turnover, and overall improved efficiency.

I recall the time, and it has not been so many years ago, when the overseer was the undisputed boss of his department. The superintendent expected him to run his department and would call him on the "carpet" when he didn't. He was usually a respected member of his community, living in the best house, frequently owning his own home. He was a leader in his church, lodge, and in civic affairs of the community.

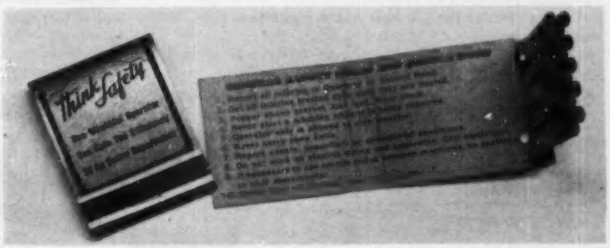
With changing labor conditions and the greater participation of employees in industrial affairs, the foreman has lost much of his former prestige. If an operative does not like the way the foreman handles a matter, he simply complains to his shop committeeman who takes the question up with the company officials, frequently resulting in a reversal of the foreman's opinion and consequent loss of "face" on his part.

Perhaps the overseer is at fault by his arbitrary attitude or by snap decisions made without obtaining all the facts in the case before taking action. Top management is not without blame, however, by failing to require the overseers to keep abreast of changing conditions and, specifically, by withholding facts about company policy and neglecting to

Twenty Salesmen Sell Safety

SEVERAL mills are now using book matches to keep employees reminded of the need to observe safety rules in the plant and on the mill grounds. The book matches are used also to keep operatives posted on the need for efficiency and the need for reducing waste.

The matches are distributed free to employees. Safety slogans, reminders of waste, and general safety rules and regulations are printed on the cover in attractive layouts (see accompanying illustration). Some mills have views of their plants printed on the cover.



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COMBINED DETERGENCY & WETTING POWER	CERFAK	Alkyl aromatic sulfonate Anionic—(Flake Type)	Used over full pH range for detergency and/or wetting. Also for compounding cleaning agents.
	CERFAK 1300	Polyoxyethylenealkyl thioether—non-ionic (Liquid)	Combined detergent and wetting agent, effective over full pH and temperature range at low concentrations. Okay in hard or soft water. Fine for raw wool scouring and cotton piece goods.
	CERFAK 1301	Blend of selected non-ionic agents (Liquid)	Excellent for scouring and dyeing woolen and worsted yarns and piece goods. Generally applicable as a detergent.
	CERFAK N-100	Amine condensate (Liquid)	Combined detergency and wetting action. Use with low per cent of alkali. Good for all types of alkaline scouring. Excellent dye bath leveler.
	CERFAK 453	Blend of selected anionic and non-ionic agents (Liquid)	Moderately priced surface active agent. Stable in bleach baths. Will not affect enzymes used in desizing. Non-staining. Wide pH effectiveness. Rapid wetting speed, excellent rewetting ability, good scouring ability. Specially adapted for fabrics to be "Sanforized"
WETTING & REWETTING	SURFAX 1288	Alkylaroyl sulfopropionic ester (Liquid)	Concentrated wetting and rewetting agent. Used in neutral or mildly alkaline solutions. An exclusive Houghton research development.
	SURFAX W. O.	Sulfated fatty ester (Liquid)	Combined penetrant, softener, wetting and rewetting agent. Recognized in textile industry as a standard of comparison.

"WHICH Surface active agent shall I use in my wet processing?"

That is a sensible question, because textile mill men might well be confused. Choosing one out of some 700 surface active agents for a specific application is no simple task! Yet it is essential to find just the *right* one that will do the best job, most economically. Nearly every surfactant combines detergent, wetting, and rewetting qualities in some measure—but usually one of these properties is dominant. The chart above will help you differentiate between Houghton's seven agents which cover the field so well. And to make another point clearer, let's differentiate between the two Houghton trade names, too...

USE "CERFAK" when *detergency* is the chief factor in your processing. Each of these five "Cerfak" products, however, were developed after considerable study for particular processing jobs in the textile industries. This wide range permits you to pick the one that fits the job best and reduces your processing costs.

USE "SURFAX" when exceptionally good *wetting and rewetting agents* are needed because they possess little or no detergent advantages. "Surfax" means topnotch *wetting* action, also provides necessary wet-back properties for compressive shrinkage of fabrics.

WRITE FOR BULLETINS

. . . to E. F. Houghton & Co., Philadelphia 33, Pa. . . . or ask the Houghton man to help you select the *right* surface active agent for specific jobs.

. . . products of

E. F. HOUGHTON & CO.

PHILADELPHIA • CHICAGO • DETROIT • SAN FRANCISCO

Ready to give you on-the-job service . . .

give other information which would make it easier for the foreman to make correct decisions.

The foreman should be given the latest available information on labor relations. Maybe it should be in the form of a course in job relations taught by an outside expert or by a qualified company official. Perhaps he should take a correspondence course. Certainly literature on the subject will help. In some instances a combination of these things is needed. By all means, the foreman should learn that in the new concept of labor management his place is that of a leader rather than a boss.

All overseers should be fully informed on every phase of company policy which may either directly or indirectly affect their jobs or have any bearing on decisions they may be called on to make. In my opinion, there is nothing which lowers the standing of the overseer more than for the operatives to be better informed on company policy than he is. In mills which do not have unions, this may not be true. In mills with union contracts, it is entirely possible for the employees to learn of wage agreements and other important matters affecting labor relations before the overseer knows about them.

I have been informed that a large oil company gives each supervisor a copy of the proceedings of each day's contract negotiations, not later than noon of the following day. They are kept well informed of any arbitration proceedings affecting their respective departments.

The foremen should be informed as to the financial standing of the company and market conditions. They should know of any complaints by the customers, either as to quality or delivery, and in the event a customer has a word of praise concerning either the product or service, this too should be passed along to them.

I am of the opinion that a weekly overseers' meeting is a very good medium for presenting much of this information to the supervisors. In addition to the things mentioned in the foregoing paragraphs, the superintendent can discuss with his men other important factors. These include items such as cost, waste, efficiency, safety, and other problems confronting the mill management. In these meetings, the foremen should be urged to bring up their own special problems for general discussion. Another foreman may have a solution to offer.

Any plans regarding expansion, curtailment, change of product or process, purchase of new equipment, contracts let for improvements, and plans for surveys should be discussed at these meetings. Care should be taken not to bring up proposals prematurely. As soon as it is certain that any change is to be made, the overseers should be given all the pertinent facts so that they can give an intelligent reply to any questions posed by the operatives, thereby dispelling many false rumors.

Each overseer should have a private office where employees may discuss with him their problems or grievances. The overseer should have suitable office equipment and a comfortable chair and desk so that his work can be performed in an efficient manner. In departments where considerable paper work is necessary, he should have a clerk. In smaller departments, perhaps two or more foremen could share the services of a clerk.

An inter-department telephone and call system will contribute immeasurably to the efficiency of the supervisory staff of a plant. Such a system would save much time when a key man is to be located. A call system is especially necessary where a full-time clerk is not on duty in each office in the mill.

In larger plants where facilities are available, certain information could be given the overseers in the form of bulletins. Such bulletins are especially good for passing along facts regarding new or impending labor laws, changes in shop rules, arbitration findings, cost, waste, and safety reports. Records of overseers' meetings may be passed along in these bulletins, permitting the overseer to review what took place in the meeting and also giving him an opportunity to pass the information along to his assistants. Naturally it is not always advisable to give out some facts which are discussed in foremen's meetings, so it would be well for the

Kink Contest

$ $ Your Idea May Win $100 $ $

This contest ends March 15, 1951

ONE HUNDRED DOLLARS will be awarded for the most helpful short cut, kink, time-saving device, cost-cutting suggestion, or quality improvement idea submitted by March 15.

Contributions eligible for the prize must not have appeared elsewhere and must not be sent to any other publication.

All material will be paid for at regular space rates upon acceptance, irrespective of the contest winner. Advise when submitting entry if participant's name may be used. Only one award will be made at the close of each contest.

Participants are not restricted as to number of items submitted to compete in the contest. Each entry should be described in sufficient detail to make it easily understood, and where possible, glossy photographs or pencil sketches should be included. Finished drawings are not necessary.

All entries for this contest must be postmarked not later than midnight, March 15, 1951. Address: Editor "Textile Industries," 806 Peachtree Street, N. E., Atlanta 5, Georgia.

SKF PIONEER in earning HASH MARKS FOR EFFICIENCY

Oil Cushion Ring Brake Type, heavy duty—provides effective damping action.

Cylindrical Type, medium duty—for use with wooden bobbins and paper tubes.

7207

MILL	YEARS OF SERVICE
ARISTA MILLS	19
ELK COTTON MILLS	12
ERWIN COTTON MILLS	19
HARTSVILLE COTTON MILLS	17
INMAN MILLS	14
PACIFIC MILLS (LYMAN)	10
WASHINGTON MILLS	18
AMERICAN VISCOSE CORP.	11
TENNESSEE EASTMAN CO.	10

Here is a *partial* list of mills where SKF Bolsters are building up an impressive record for lasting economy.

HERE'S WHY:

SKF Bolsters minimize friction and effect average power savings of 15%. Twist is more uniform. Yarn breaking strength is greater. Ends down are less. Oil-throwing is eliminated. SKF Bolsters can be removed and replaced, when necessary, without renewing case or spindle blade.

Let SKF Bolsters start earning efficiency hash-marks in *your* mill. With the help of SKF engineers and the wealth of experience of spinning frame manufacturers, you can produce higher-quality, more salable fabrics at *lower production cost.*

8 REASONS WHY SKF IS PREFERRED BY ALL INDUSTRY

integrity
craftsmanship
metallurgy
tolerance control
surface finish
product uniformity
engineering service
field service

SKF

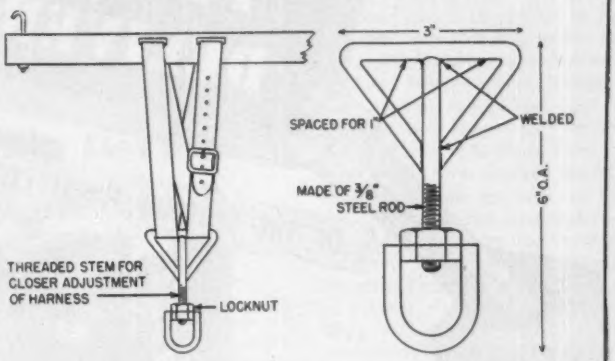
SKF INDUSTRIES, INC., PHILA. 32, PA.—*manufacturers of* SKF *and* HESS-BRIGHT *bearings*

superintendent to edit these bulletins before publication.

In mills with union contracts, it is customary to furnish the overseers and their assistants with copies of such contracts as soon as they have been published. Management should not be satisfied with just handing out these booklets, but it should call a special foremen's meeting where the various points and provisions of the contract can be discussed. As the contract begins to operate and various groups begin to put their own interpretation on certain provisions, other meetings will be necessary to keep all the foremen informed as to the latest developments. In some instances the assistant foremen may be brought into these meetings because they are in direct contact with the operatives, and frequently their misunderstanding of a clause in the contract is the cause for a grievance.

I do not claim that any of the foregoing suggestions are either new or original, but they are worth trying.

CONTRIBUTOR No. 8259



Treadle Link for Loom Harness Adjustment

EDITOR TEXTILE INDUSTRIES:

The treadle link, shown in the illustration, has proved helpful in our weave room. Some advantages of the parts in operation on our looms are as follows:

(1) The straps maintain even tension on both upward and downward motion.

(2) The double strap arrangement prolongs the life of straps in that there is only half the strain at any one point.

(3) More accurate adjustment of harnesses can be made by moving the buckle from one hole to another (at half-inch intervals); the harness is raised or lowered only one-eighth of an inch, instead of one-fourth inch as compared with the single strap.

Further adjustment can be made by using the locknut and the threaded bottom. I believe this is a worthwhile improvement to make on many looms, especially in weaving heavy goods. CONTRIBUTOR No. 8352

Discussion on Bad Picker Laps

EDITOR TEXTILE INDUSTRIES:

I should like to pose a question about uneven picker laps.

We have two Whitin one-process pickers equipped with Buckley openers at the breaker section, one three-blade beater at the intermediate section, and one carding beater at the finisher section. Each picker has three fans which operate at approximately 1300 rpm.

We have checked the mechanical condition of these machines and found no apron slippage. The gears are good, and all other parts are in good condition. Our picker laps are uneven, although the machines are apparently in good working order.

The dust flues and chimney are 2.68 feet deep and cover an area of 48 square feet. Our picker laps weigh 14 ounces per yard and do not vary more than ¾ ounce per yard.

The opinions of some of your readers regarding this question would be greatly appreciated.

CONTRIBUTOR No. 8317

Editor's Note: In order to be of immediate service to the reader, this question was answered prior to publication. The solicited information is published here along with the question. Other opinions are invited.

EDITOR TEXTILE INDUSTRIES:

It appears that CONTRIBUTOR No. 8317 does not have sufficient escape area for his fan exhausts. He says that he has two three-beater pickers. This means that six fans are exhausting into his dust cellar which he describes as being only 2.68 feet deep with an area of only 48 square feet.

As a matter of fact, he speaks of this space as the dust flues and chimney. I don't understand this particular statement since he says that the depth is only slightly more than two and a half feet.

My recommendation for dust chambers is that a minimum of 5 sq ft of space be provided for each fan exhausting into the dust house. Also, the space from the dust room into the chimney should be equal to the area of the chimney itself.

Secondly, a variation of ¾ ounce per yard is too high for a good lap. Many mills are holding

EASY SETTING
RIGID CONSTRUCTION

With Platt Bros. Revolving Flat Card, due to the exceptionally strong cross-rail construction and rigid foundation, accurate settings are easy to obtain and hold, insuring the production of an even, nepless web for both light and heavy carding. Vibration is virtually eliminated and air currents minimized. An independent motor drive does not increase the overall width of this well-designed machine. Cut staple fibers can be worked very satisfactorily on this card. Standard widths of 40" or 45" are available for prompt delivery.

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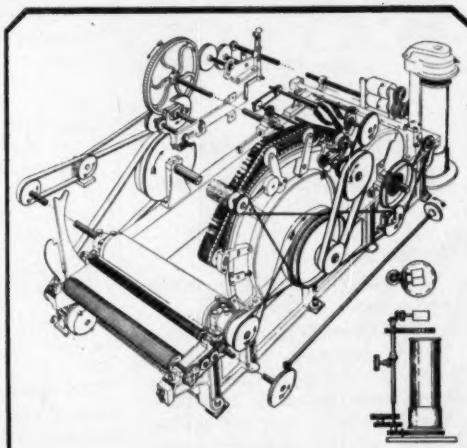


STANDARD SPECIFICATIONS: 40" wide . . . Clothing for your requirements . . . Dish feed plate with fluted steel roller 2¼" dia. . . . Licker-in 9½" dia. covered with inserted saw-tooth wire-8 starts, 36 points per sq. in. . . . Ball bearings to licker-in pedestals . . . Cylinder 50" dia. . . . 106 flats 1⅜" broad . . . Improved flat grinding apparatus for grinding wire and flats from working surface . . . Improved front driving arrangement to flats . . . Doffer 27" dia. . . . Improved fly doffing comb. . . . Calender rolls 4" dia. . . . Coiler and can motions for sliver cans 36" long and 12" or 14" internal dia. . . . Machine cut gears and bevels throughout . . . Strap guide motion with handle bar . . . Pickford's locking motion with patented arrangement to obviate removal of strap fork during cylinder grinding . . . Drive to your requirements . . . Draft constant from lap roller to coiler calenders in the standard model may be 1680 or 2240 as required.

yard-for-yard variation to 2/5 of an ounce or less. It is suggested that CONTRIBUTOR No. 8317 check his evener motions carefully. The evener motion should be very sensitive, and the evener belt should be of the best quality and not over 1 inch wide. Also, if belt dressing is being applied to the evener belts, this practice should be stopped. CONTRIBUTOR No. 8320

Anti-Ballooning Device for Magazine Cone Creels

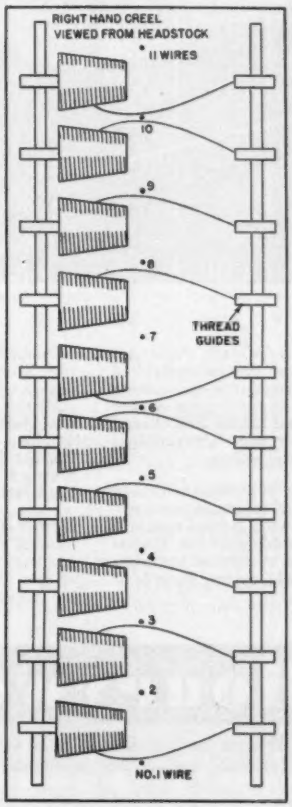
EDITOR TEXTILE INDUSTRIES:

When warping very low counts, yarns with high twist, or linen yarns, from cones in high speed warpers, the general tendency is for the yarn to develop "excessive ballooning." So excessive is this ballooning that the threads lash against one another, become entangled, and cause excessive stoppages. Production is seriously curtailed, and the danger of lappers and crossed ends when running off at the slasher is greatly increased.

The usual remedy is to reduce speed to one half or one third to counteract such ballooning. Although slow speeds produce better warper beams, production is reduced considerably.

A common type of creel has 10 horizontal rows of cones and in a 400-end creel there are 20 uprights on each side. There are 200 cones on each side, and the center-to-center distance on each upright between the cones is about 8½". To prevent excessive ballooning at high speed on this type of creel, stretch a soft type of wire (about ⅛" dia) from front to back in each wing of the creel. 11 lengths of wire are required for each side of the creel. The wires should pass between horizontal lines of the cones. Each line of cones should have a wire above and below and centered between the horizontal lines of cones.

To secure the wires, three 1¼" x 1¼" lengths of angle iron are necessary. One piece of angle iron may be secured to the base of the creel and also to the top of the creel at the front or headstock end. Another piece of angle iron should be secured at the place where the creel bends. The third piece of angle iron may be placed at the extreme end of the creel, and the rigid angle irons should be placed upright so that they are centered about ½" in front of the cones.



Holes should be drilled in the uprights; the first one below the lower line of cones and each succeeding hole midway between each line of cones. The final or eleventh hole should be over the top row of cones. Each piece of wire should pass through the corresponding hole in each of the three uprights (see accompanying illustration). Secure the wire to the front upright, pass it through the second upright, and secure it to a bracket in the rear upright. Wing nuts may be used on the brackets to control tension on each wire individually.

When the warper is run at high speed, ballooning at the creel is checked by the wires which prevent the threads from being thrown outward too far. The sketch indicates the approximate position of the anti-ballooning wires. The wires do not cause trouble to the operator, and they do not interfere with creeling. They need no care if properly installed and provide good control over ballooning. Production and quality of the warper beams are equal to those run at slower speeds and are beneficial for use when running numerous types of yarns.

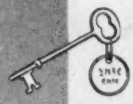
CONTRIBUTOR No. 8348.

Question on Card Doffer Cylinder

EDITOR TEXTILE INDUSTRIES:

I should like to learn what some practical carders and mill superintendents have to say about the card doffer cylinder. What function does the doffer cylinder have in the carding operation? Does it serve in paralleling the fibers; does it perform part of the cleaning operation? Why does the doffer cylinder have to be so large in diameter and take up so much floor space? If the doffer were smaller in diameter, would it require a faster doffer comb speed? Any enlightening comments on this subject would be appreciated.

CONTRIBUTOR No. 8357



BROWN INSTRUMENTATION IS KEYED TO THE NEED OF EVERY TEXTILE PROCESS

A MORE WEAVEABLE WARP

and more of it

. . . with the ELECTRONIC *Moist-O-Graph* CONTROLLER

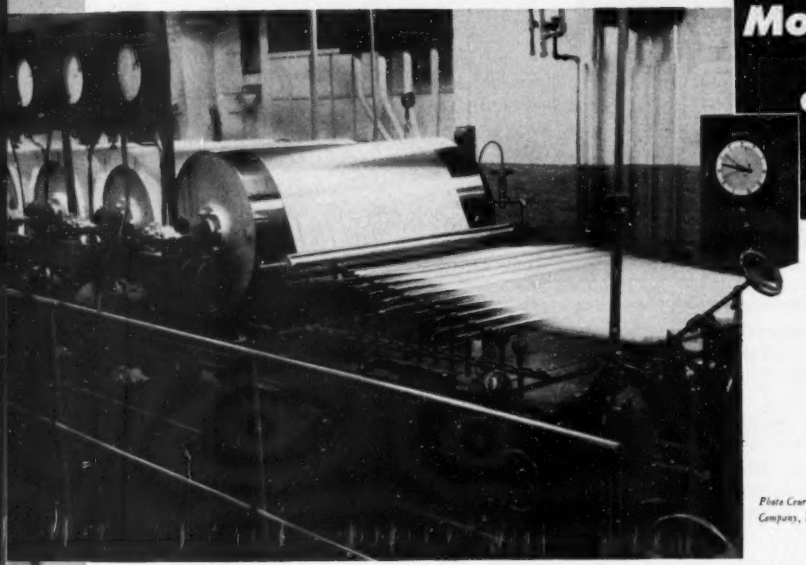


Photo Courtesy of Stehli & Company, Inc., Lancaster, Pa.

THE Brown electronic *Moist-O-Graph* controller brings a new simplicity to the precise control of regain. It employs fewer moving parts, minimizing maintenance . . . is adaptable to any type of slasher drive . . . has factory calibrated ranges that extend its applications to include virtually all combinations of fibers, their blends and sizings.

The *Moist-O-Graph* controller is a result of Brown pioneering in the techniques of moisture measurement and control, combined with Brown specialization in the processes and problems of the Textile Industry . . . it is an improved version of the most widely used system in the world, setting records of regain control within ± ¼ of 1%.

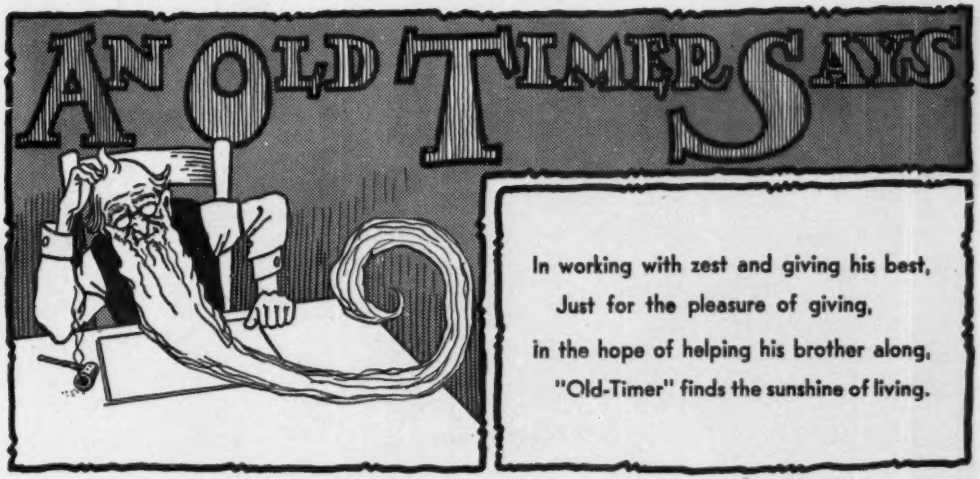
Like all Brown products for the Textile Industry, the *Moist-O-Graph* controller is backed by a nation-wide organization of factory-trained installation and service engineers . . . which means that start-ups require a minimum of mill attention.

For detailed information, write for copies of Data Sheets 8.1-37, 8.1-4A and 8.1-27 . . . or call in your local Honeywell engineer.

MINNEAPOLIS-HONEYWELL REGULATOR CO., *Industrial Division*, 4492 Wayne Ave., Philadelphia 44, Pa. Offices in more than 80 principal cities of the United States, Canada and throughout the world.

MINNEAPOLIS **Honeywell**

BROWN INSTRUMENTS


AN OLD TIMER SAYS
In working with zest and giving his best,
Just for the pleasure of giving,
in the hope of helping his brother along,
"Old-Timer" finds the sunshine of living.

Random Thoughts

"People Are Funny. But Why?" Sure! People are funny! But you usually can learn something about human nature when you make a study of *why* they are funny. In the first place, people do not like to THINK. It takes effort to think. What we mean is *constructive* thinking. This reasoning may sound a little weak to the average reader but it is true, nevertheless.

Constructive thinking may not sound like hard work—then why don't more people engage in constructive thinking—why does the average overseer or superintendent go through the routine of his regular day's duties and then feel like he has done his day's work?

Study the liquor and cigarette advertisements. Why do people respond to them and buy liquor and cigarettes? We don't suppose the person has been born yet who really liked liquor or tobacco the first time he tasted them. The taste of both at first are really unpleasant.

Neither can an advertiser claim they are good for a person's health. Therefore the advertisements must be appealing and suggestive. The girl or woman sees the beautiful movie star sitting in sumptuous quarters smoking a cigarette; she takes up smoking without THINKING. So does the liquor ad appeal to many thousands of men.

Yes, people are funny, but overseers and superintendents can learn something about human nature by studying *why* they are funny.

A weaver puts in warp ends without thinking—a spinner puts up ends without thinking—a section man works on a machine without thinking—his thoughts may be of what he is going to do tonight or Saturday afternoon—when you want operatives to *think*, you should do a lot of thinking *before* you put your proposition up to them.

Yes, we suppose you have tried the suggestion box idea and decided there is nothing much to it. Well, brother, that is probably your fault, because there are many firms which have gotten good results from the idea. There was something wrong in your method or you just did not give it much thought.

When no constructive or practical suggestions were found in the box, did you try to find out why?

It is a psychological fact—a fact of human nature, to express it more simply, that operatives do want to feel that they are a part of the firm; they naturally want to be considered more than just a cog in a wheel.

Anything you can do to arouse their interest will add greatly to their loyalty and their interest in their work.

Give it a thought.

A Lesson in Human Nature. During World War II several thousand foremen were trained, not in managing machines, but in managing men and women. They were taught that their biggest job was learning human nature.

Having learned something about it, they increased production in practically every case and in some instances as much as 25%.

Can you censure OLD-TIMER for giving you so many articles on Human Nature?

What's the inside story at Sapphire?

Behind these doors, the Sapphire Hosiery Corporation, Telford, Pa., turns out sheer full-fashioned nylon hosiery. And the inside story is air conditioning . . . the Carrier kind.

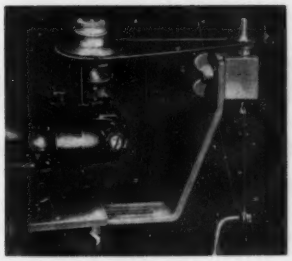
In this unusual installation the ducts are completely concealed. You see, they run between the suspended acoustical ceiling and the roof. This ceiling is perforated, and the air returning to the apparatus room filters uniformly up through the ceiling. As a result, the air distribution is almost perfect and temperatures are exceptionally uniform.

This is a typical example of the leadership and imagination with which Carrier engineers serve the textile industry. And it shows the benefits of close collaboration between mill management and Carrier . . . in this case before the construction started.

Built just three years ago, this mill has operated so successfully that the plant is being enlarged. The plant expansion will be air conditioned. And Carrier will do the job. Carrier Corporation, Syracuse 1, New York.

Carrier AIR CONDITIONING • REFRIGERATION • INDUSTRIAL HEATING

NEW Equipment AND MATERIALS



EVENNESS of low-twist filament yarn is measured by a Uster tester (photo at left) used in conjunction with the "Rotafil" device. Photo above is close-up of "Rotafil" unit.

Low-Twist Filament Yarn Evenness Can Be Measured Accurately

A device has been developed which now makes it possible to measure accurately the evenness of linear density in low-twist filament yarns.

Known as the "Rotafil" unit, it twists and rotates the yarn as it is measured by conventional electronic testers and then removes the twist. This is done with the use of a simple false-twisting tube with accurately set guides. In this way, the form factor is eliminated by increasing the number of flats and edges in the pick-up area and by keeping that number relatively constant through rotating the yarn on its axis as it is drawn through the pick-up element.

The device is applicable to at least three makes of testers: the Uster Evenness Tester, the Brush Uniformity Analyzer, and the Serc Electron Micrometer.

Conventional twisting spindles may be used, but a simple false-twisting tube with accurate guides to center the rotating yarn within the pick-up slot and to reduce balloon formation to a minimum has proved adequate. The accompanying photograph showing a close-up view of the Rotafil clearly discloses its simplicity of construction and how it is driven by a spring belt from a small laboratory-type variable speed motor.

"Rotafil" is offered on a non-exclusive, royalty-free basis as a contribution of American Viscose Corporation to the maintenance of quality standards. While more complete data, drawings, and photographs are available on request, demonstrations of the machine can be arranged at Marcus Hook by appointment where the services and background of the Mechanical Development Branch are offered to those interested in the work.

American Viscose Corp., 350 Fifth Ave., New York, N. Y.

For additional data, request item C-107, using business reply card on page 230.

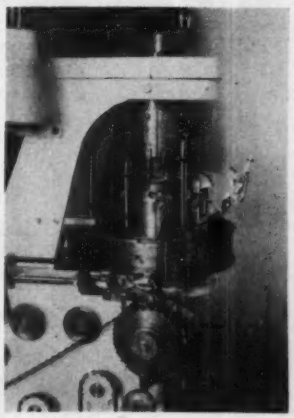
New Product Improves Print Washing Operation

"Atconil PW-35" is a new product that is said to bring about complete removal of loose color and gums in print washing operations.

It has gum dissolving properties which are described as outstanding; also, the manufacturer claims that it is an excellent dispersing agent for loose and unfixed color. Foaming

Apex Rib Knitter Available in U. S.

Construction details of the cylinder of an Apex rib knitting machine, manufactured by A. Kirkland & Co., Ltd., of Leicester, England, may be seen in this close-up view. This line of knitting machines, being produced in 84, 132, 168, and 200-needle styles in usual diameters for men's and children's hose, is now available in the United States from Morris Speizman Co., Inc., distributor in the Western Hemisphere for the British machinery manufacturer.



Morris Speizman Co., Inc., 506-514 West Fifth St., Charlotte 1, N. C.

For additional data, request item C-109, using business reply card on page 230.

Complete Blending, Opening, Cleaning and Picking Systems for Cotton Mills

Opening, Blending and Picking Systems for Synthetic Fibers

New, and Rebuilt, Single-Process Pickers

The Aldrich Synchronized Single Process Picking System has consistently produced more uniform card sliver than any other picking system.

Parts for Kitson Pickers Always in Stock for Immediate Delivery

AldricH MachinE

Greenwood **WorkS** South Carolina

properties have been adjusted so that a light foam forms on the surface of the bath, preventing scum formation, and also gives an indication of the condition of the scouring liquor.

More brilliant prints, improved white grounds and discharge whites, are other benefits to be derived from the use of the product, according to the manufacturer.

Recommended application: .1% concentration at temperatures ranging from 115 F to the boil.

Atlantic Chemical Co., Centredale, R. I.

For additional data, request item C-108, using business reply card on page 230.

Time-Saving Attachment for Spoolers and Winders

A new attachment (protected by U. S. patent No. 2,536,510) for spooling and winding machines can be applied to most of the standard Foster and Universal winders that are creeled with spinning bobbins.

Bobbins are brought from the spinning room or conditioning machine in a bucket which runs on an overhead rail. The entire contents of the bucket are, in turn, emptied into a large-capacity hopper by tilting the bucket with only one movement of the arm.

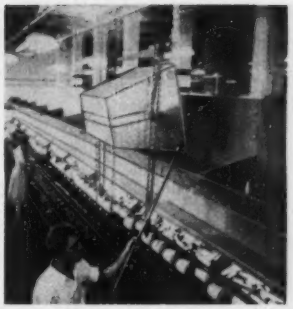
Through the use of the large overhead hopper, a sufficient number of bobbins of yarn can be stored to operate the machines for a full shift and in some cases a full day, depending on the size of the yarn being processed.

The new device provides a natural "first in-first out" supply of bobbins for the machine tender, eliminating the possibility of yarn becoming dirty or dry from infrequent use. Another advantage claimed for the arrangement is that supply bobbins are always available to tenders from the same comfortable level.

Full packages doffed from the spooler or winder are placed upon an endless conveyor belt and transported to a cone hopper, container, or inspection table. This can be done continuously or periodically as required, and packages can be inspected and/or wrapped simultaneously.

Another conveyor system is provided to return empty bobbins to the spinning room.

With this servicing installation, machine tenders can, according to the announcement, handle more spindles than previously, and work load of yarn carriers is reduced, resulting in considerable savings.



Yarn handling device for spoolers and winders (P.O.M. Co.).

P. O. M. Co.—Werner Textile Consultants, 60 East 42nd St., New York 17, N. Y.

For additional data, request item C-106, using business reply card on page 230.

Single Spindle Winder for Hosiery Bobbins

Specially developed for those hosiery manufacturers whose production of half-hose is not sufficiently large to justify the use of a full-size hosiery bobbin winder, a new single-spindle winder has been introduced by Muschamp Taylor Ltd., of Vulcan Works, Polard-street, Manchester, England.

The machine is self-contained and is mounted on a base board which can be fixed to any work bench. It consists of an orthodox single-spindle winding head with conventional disc build, the spindle being driven by a 1/6 hp electric motor mounted on the same base board and operating through a push button starter.

An important feature claimed for the machine is the slow-start drive, which reduces the danger of end breakages on starting up. A simple creel to take any type of yarn package is fitted, the yarn being taken overend from the package through disc tension to the spindle.

Power consumption is low and the self-contained design of the machine simplifies moving from one part of the plant to another. It can be supplied with a stand if required.

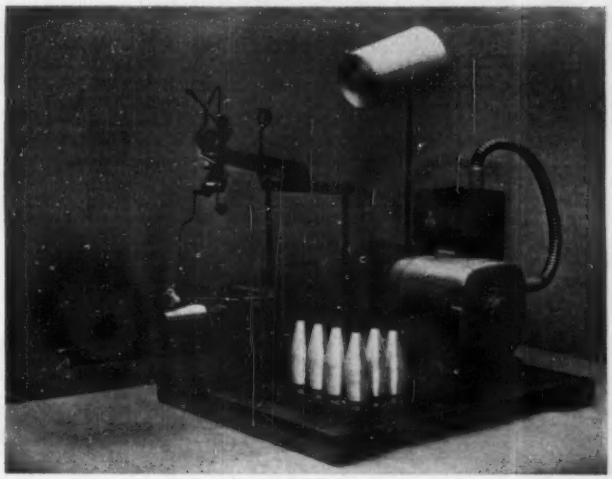
Foster Machine Co., Westfield, Mass.

For additional data, request item C-104, using business reply card on page 230.

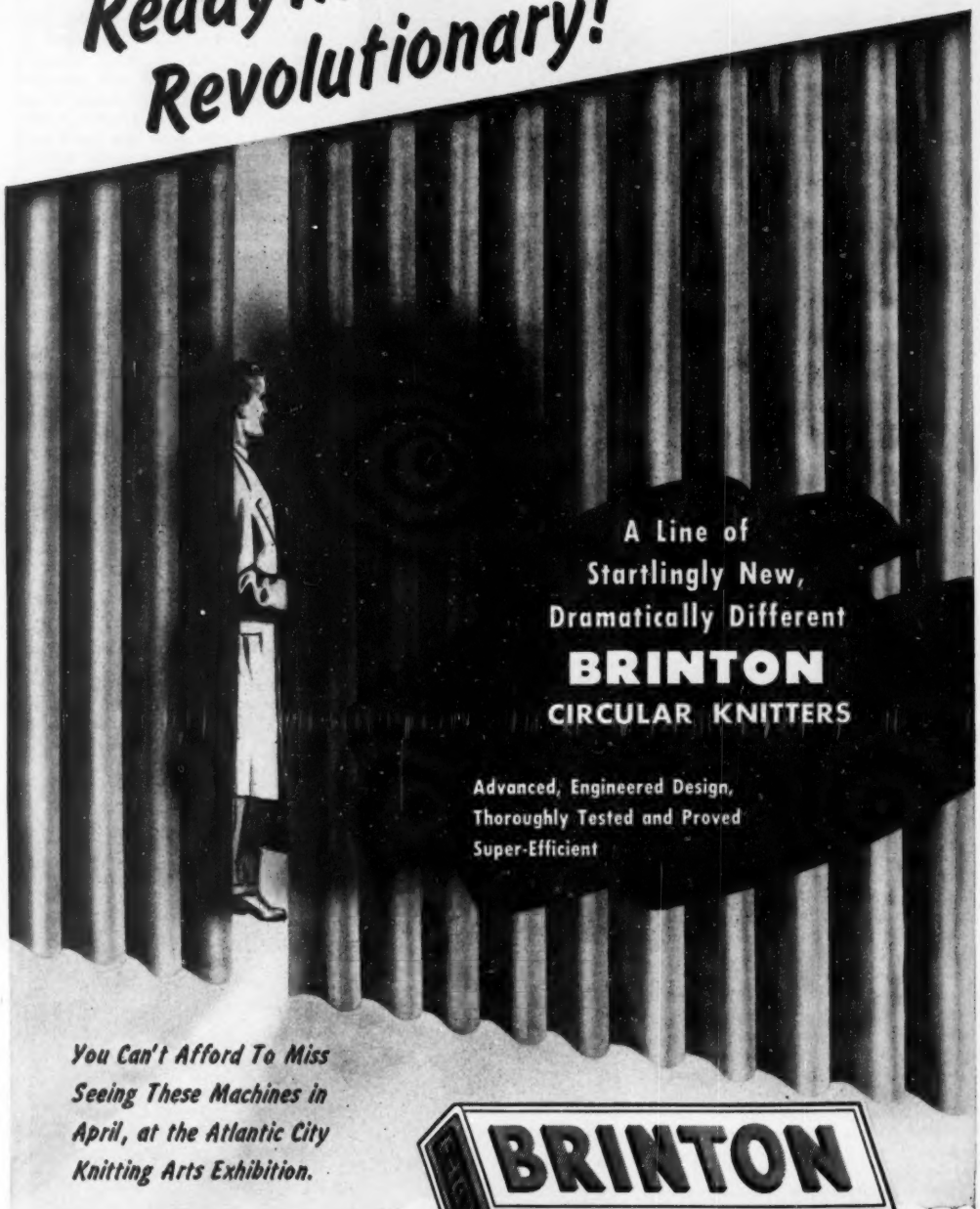
Universal Moisture Tester

The Universal moisture tester, designed for all types of material, gives direct moisture percentage readings on a dial from 8½ to 40%, instantly, without mathematical calculations or charts. Equipped with a built-in

Single spindle winder for knitting yarns (Foster).



Ready...and Revolutionary!



A Line of
Startlingly New,
Dramatically Different

BRINTON
CIRCULAR KNITTERS

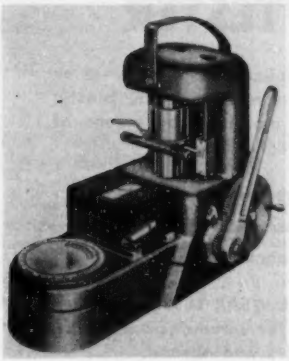
Advanced, Engineered Design,
Thoroughly Tested and Proved
Super-Efficient

You Can't Afford To Miss Seeing These Machines in April, at the Atlantic City Knitting Arts Exhibition.

BRINTON
CIRCULAR KNITTING MACHINES

KENSINGTON AVE. & M ST., PHILA. 24, PA., U. S. A.

NEW Equipment AND MATERIALS



Universal moisture tester (Burrows).

thermometer, the instrument automatically indicates temperature of sample.

The instrument is said to be simple to operate and is consistently accurate, giving the same reading repeatedly on the same sample. Complete tests are made in less than a minute, it is claimed.

Although the device operates by electricity, it requires no electrical outlets or batteries and is fully portable.

Burrows Equipment Company, 1316 Sherman Ave., Evanston, Ill.

For additional data, request item C-112, using business reply card on page 230.

"Kelpie" Anti-Shrink Process for Woolens Available in U. S. A.

The continuous wet chlorination Scotch anti-shrink process for wool that has, according to reports, been used successfully in the British Isles and Canada since 1935, is now available in the United States for manufacturers of woolens.

S & M Dye Works, Inc., Philadelphia, Pa., agents for the process in this country, have announced that this is the first anti-shrink process to pass the Quartermaster Corps specifications for all-wool sweaters. Lindsey H. Mason, president of S & M Dye Works, in making the announcement, said "As a result of tests made by government research bureaus, we can guarantee that the

If you could have what you want

in Direct

Humidification

How about a system that shoots the works when conditions warrant it? Or . . . delivers a mere breath, when that little will do? AND . . . every varying amount in between, automatically; from 16 pounds (per hour, that is) from each atomizer to a mere 2 pounds? Spray so fog-like, its 2-pound delivery is hard to see . . . and its 16-pound delivery hard to believe.

But would you care for it unless it was safe from overflow, leakage or wetting down? And wouldn't you appreciate it if air and water ports . . . both were self-cleaning?

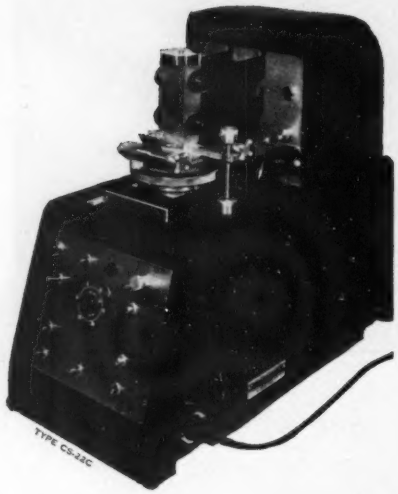
Advantageous as all this is, would you bother with such a system if it ate its head off in power? Or upkeep? Or repairs? Or had to be tinkered with, or frequently tested or readjusted?

All these improvements are now available in the new ParksTurbo Gradumatic Humidifying System.

Write for Bulletin 450

Parks-Cramer Company

Fitchburg, Mass. PARKS Certified Climate Charlotte, N. C.



THE CSI-STOLL QUARTERMASTER

UNIVERSAL WEAR TESTER

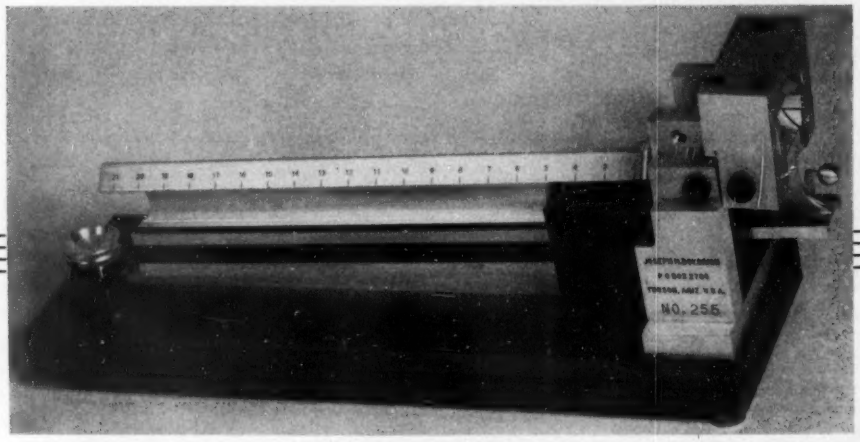
The instrument which duplicates service wear on textiles, coated and laminated fabrics, plastic films, and many other materials by means of accurate reproducible tests of:

- **Flat abrasion**
- **Flex abrasion**
- **Edge abrasion**

The precision UNIVERSAL WEAR TESTER is simple to operate and provides for automatic end points. Now in use in this country and abroad.

For literature and prices write Dept. S

CSI **CUSTOM SCIENTIFIC INSTRUMENTS, INC.**
Post Office Box 170 Arlington, N. J.
MANUFACTURERS OF CUSTOM-BUILT LABORATORY EQUIPMENT **CSI**



THE PRESSLEY FIBER STRENGTH TESTER

Built and Offered for Sale

By

JOSEPH M. DOEBRICH

P. O. BOX 2789 TUCSON, ARIZONA, U. S. A.

Kelpie process meets anti-shrink specifications when applied to all-wool products, including top, yarn, knitted cloth, and hosiery."

Kelpie can be applied in the mill dyehouse. Application in the skein form is recommended.

Kelpie (U. S. A.) Ltd., Inc., 3419 Richmond St., Philadelphia 34, Pa.

For additional data, request item C-102, using business reply card on page 230.

Split Pairs Eliminated with New Hosiery Counter

Designed for pairing all types of hosiery, a new pairer counter is operated by touching an easily tripped button as the stockings are inspected, paired, and laid aside. A bell signals at the count of twelve, and to safeguard against overages and shortages, the counter locks. Split pairs are definitely eliminated, the manufacturer claims.

Hickory Foundry & Machine Co., Hickory, N. C.

For additional data, request item C-103, using business reply card on page 230.

Stroboscope for Studying Shuttles in Motion

A high intensity stroboscope specially designed for viewing a shuttle in motion on the loom, is available.

The flash tube gives an intense flash of white light of very short duration exactly synchronized with each cycle of mechanism under investigation, thus giving a visual effect of "freezing" the movement.

It is synchronized with the machine motion by a contactor fitted with a remote control so that the shuttle may be viewed at any desired position in the warp. Speed of shuttle can be accurately determined by relating the shuttle position to stroboscopically determined angular settings of the loom drive shaft.

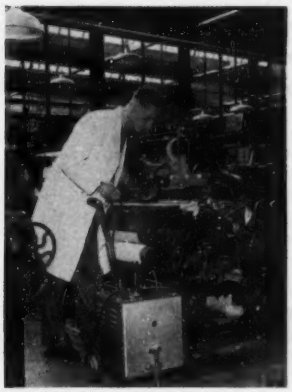
For convenience of operation, phase control is combined with the lamp assembly.

It is said that the unit enables the lay of the thread from the front of the shuttle to be accurately determined at each stage of its progress through the loom, thereby enabling the operator to quickly locate the cause of broken thread or other weaving defects due to shuttle faults.

Dawe Instruments Ltd., 130 Uxbridge Road, Hanwell, London W-7, England.

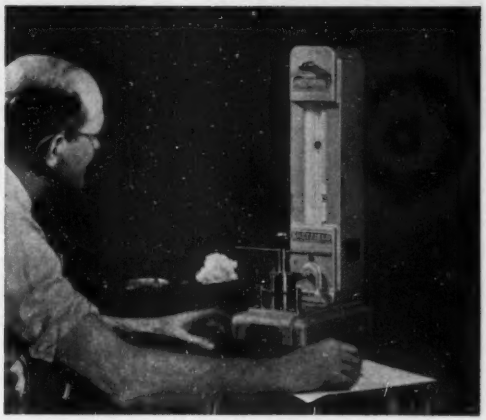
For additional data, request item C-111, using business reply card on page 230.

Studying a shuttle in motion with the "Stroboloom" (Dawes).



NEW Equipment AND MATERIALS

Sheffield Micronaire



THE ACCEPTED INSTRUMENT FOR QUICK AND ACCURATE MEASUREMENT OF TEXTILE FIBERS

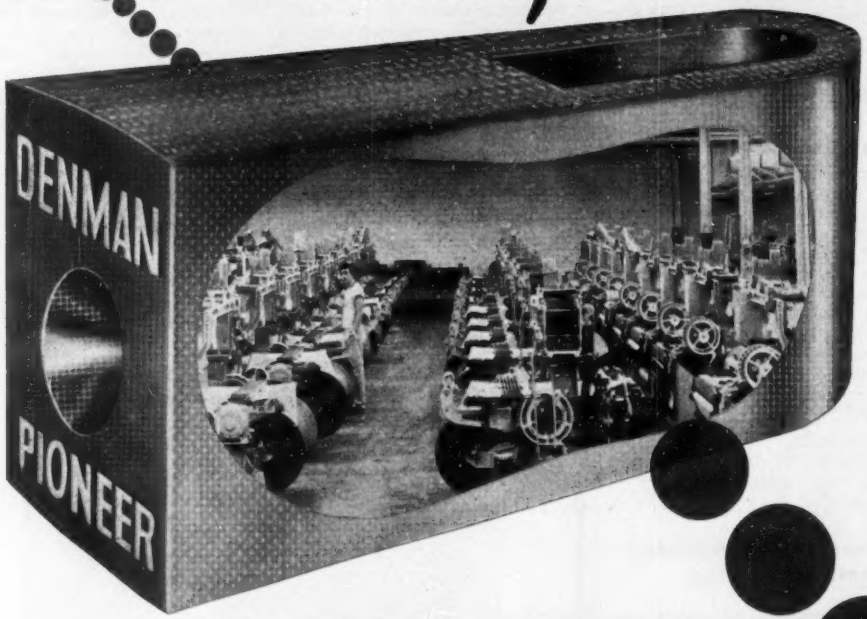
Model #60600	For Cotton Only
Model #60601	For Full Range of Wool Grades
Model #60602	Combination of #60600 and #60601
Model #60603	For Wool Grades 50's to 80's incl.

Delivery Approximately Two Weeks
Write for Complete Specifications

THE SHEFFIELD CORPORATION
Dayton 1, Ohio, U.S.A.

GAGES • PRECISION MEASURING INSTRUMENTS
MACHINE TOOLS • THREADING TOOLS • CONTRACT SERVICES

The Inside Story



of DENMAN PICKER LEADERSHIP

Men in the mills write the specifications for Denman Pioneer Pickers.

Their experience plus the close cooperation of Terrell field men and Denman laboratory research have combined to develop the outstanding characteristics of *resiliency*, *uniformity*, and *"wearability"* which make Denman the World's largest selling picker.

This close cooperation of Terrell field men with mill superintendents, weavers, and loom fixers—solving individual problems *individually*—is part of the service that goes with every Denman installation.

This accounts for Denman Pioneer being known as "The Mill Man's Picker," the picker which gives you

Lowest Cost Per Loom Per Year

WATCH DENMAN FOR THE BEST FIRST

Made by
DENMAN
Tire and Rubber Co.

Exclusive Sales Representative

The TERRELL MACHINE CO., Inc.

CHARLOTTE, N. C.

NEW Equipment AND MATERIALS

"Three-in-One" cotton truck (Towmotor).

Multi-Purpose Cotton Truck

A versatile materials handling development is the three-in-one unit that can be used with a Towmotor cotton bale stacker, hydraulic bale clamp, or standard forks. Simplified attachment to the carriage of a compact Model LT-40 Towmotor fork lift truck and quick-detachable couplings in the hydraulic lines make these three cotton handling devices interchangeable in a short time.

The unit is expressly engineered for easy maneuvering in box cars and congested areas, and for rapid stacking and "breaking out." The cotton bale stacker and a pair of pallet forks are standard equipment with the cotton truck; the stacker pivots a full 180 degrees, and includes a removable platform for added convenience in breaking out bales from storage.

Towmotor Corp., 1226 E. 152nd St., Cleveland 10, Ohio.

For additional data, request item C-105, using business reply card on page 230.

German Cotton, Rayon and Silk Industry, 1939-45

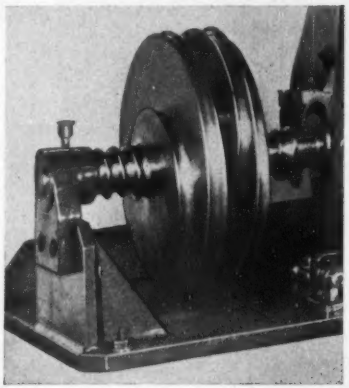
British Information Services, 30 Rockefeller Plaza, New York 20, N. Y., has available copies of the 178-page British Intelligence Objectives Sub-Committee Overall Report No. 13 entitled "Developments in the Cotton, Rayon and Silk Industries in Germany during the period 1939-1945" (price, 75 cents). The volume covers various aspects of the industry, including dyeing, bleaching, and finishing operations.

NEW Equipment AND MATERIALS

claims. At the load center, the voltage is stepped down to the value required by the load being served and automatically maintained at that level. This assures maximum life and optimum performance of connected equipment. Available in either single or three-phase ratings; capacities ranging from 15 to 100 kva, with incoming circuit rated 480 or 600 volts, 60 cycles, and a regulated output at 120/240 or 208Y/120 volts.

General Electric Co., Unit Equipment Div., Schenectady 5, N. Y. (C-206).

Solid Draft Scrolls for J&B Wool Spinning Mules



Adaptable to all types of J & B spinning mules are the recently developed solid draft scrolls. According to the manufacturer, no more scroll wings are required, scroll position is positive, coarse and fine yarns can be made with one set of solid scrolls, no down time to change scroll wings, ropes last longer.

Also available are new ball bearing bottom rolls.

Johnson & Bassett, Inc., Worcester, Mass.

For additional data, request item C-401, using business reply card on page 230.

Portable Grease Dispenser

A two-wheeled grease rig now available can be moved rapidly along plant aisles and between closely placed machines. Since all grease and oil equipment on the Lube Service Cart is removable, even remotely located machines which are inaccessible to the cart can be greased with the cart's components. It is a self-contained unit, requiring no air supply. All equipment is hand operated. Two models available: one dispenses grease from a bucket type unit which holds 30 lb of grease; the other pumps from a 25-40 lb refinery filled pail.

Gray Company, Inc., 200 Graco Square, Minneapolis 13, Minn. (C-205).

"Midget" Load Center Unit Substation

Specially designed for low-voltage, regulated a-c lighting and power service in industrial plants and laboratories is a new "midget" load center unit substation called an Inductrol Power Pack. It incorporates in one steel housing an air circuit breaker, a dry-type transformer, and an air-cooled induction regulator. With these units, power can be brought to the load area at relatively high voltage with substantial savings in cable, the manufacturer claims. At the load center, the voltage is stepped down to the value required by the load being served and automatically maintained at that level. This assures maximum life and optimum performance of connected equipment. Available in either single or three-phase ratings; capacities ranging from 15 to 100 kva, with incoming circuit rated 480 or 600 volts, 60 cycles, and a regulated output at 120/240 or 208Y/120 volts.

General Electric Co., Unit Equipment Div., Schenectady 5, N. Y. (C-206).

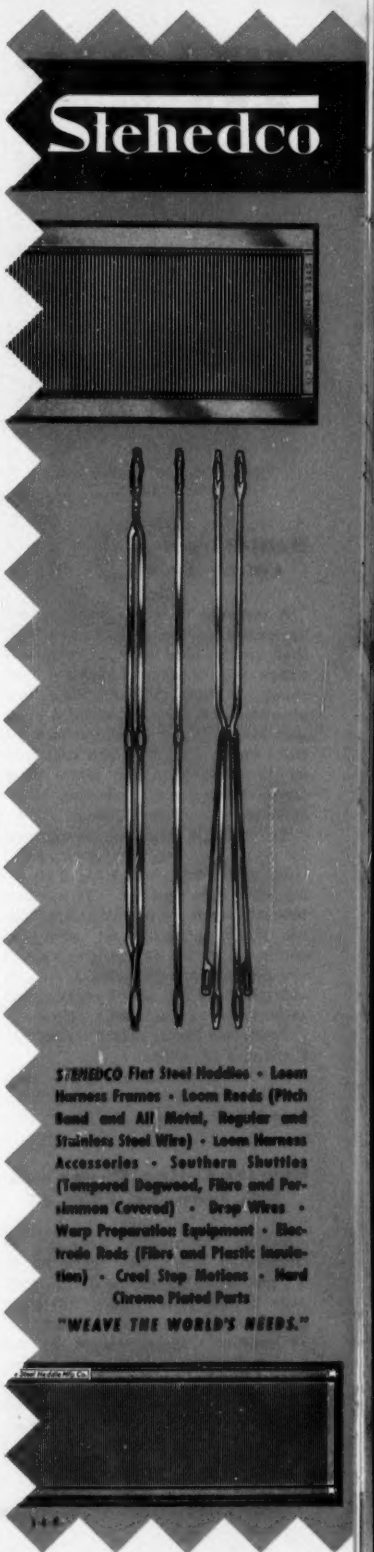
Versatile Fork Lift Truck

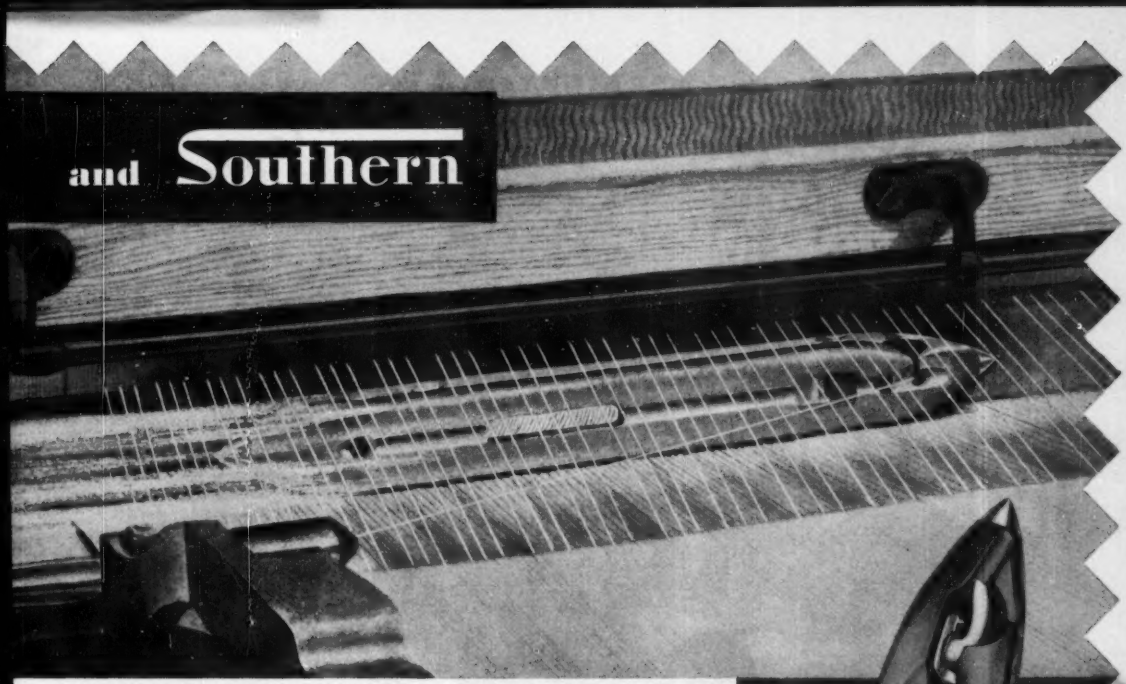
The new "Tier-Master" fork lift truck has telescoping uprights low enough to enter a motor truck van body, yet its lift will tier merchandise and materials three pallets high. The versatile model is only 72" high with the mast lowered and will lift 117" from floor to forks. 2,000-lb capacity; outside turning radius, 57 inches; zero inside turning radius.

Mobilift Corp., 1135 S. W. Yamhill St., Portland 5, Oregon (C-207).

Textile Institute Issues Year Book

The third "Year Book of the Textile Institute," the 1950-51 issue, has been published. It contains 246 pages of comprehensive textile information and technical data, as well as an outline of the objects, aims, and activities of the Institute. Also deals with standardization in textiles, lists over 120 textile terms, gives tables of equivalent yarn counts, etc. Avail-


Stehedco
STEHEDCO Flat Steel Heddles • Loom Harness Frames • Loom Reeds (Pitch Band and All Metal, Regular and Stainless Steel Wire) • Loom Harness Accessories • Southern Shuttles (Tempered Dogwood, Fibre and Persimmon Covered) • Drop Wires • Warp Preparation Equipment • Electrode Rods (Fibre and Plastic Insulation) • Creel Stop Motions • Hard Chrome Plated Parts
"WEAVE THE WORLD'S NEEDS."



NO LOOM *EVER* OUT-RUNS A "SOUTHERN" SHUTTLE . . .

. . . because—world famous "Southern" Shuttles with their—PLUS—design and construction features have the ruggedness and durability to withstand the violent impacts encountered in present day high speed loom operations.

Racing, back and forth, at 40 M.P.H. speeds, making 200 and more picks a minute, perfectly balanced, precision made Southern Shuttles smoothly handle the most delicate and tender yarns without breakage and fray—they unify loom production performance—reduce waste, cut costs and improve the quality of the run.

A member of the great Steel Heddle Family of products, Southern Shuttles always measure up to the quality standards for which all SteHedCo Loom Harness Equipment is noted. They're made in "the World's Largest *Single*-Unit Shuttle Plant" where Shuttle design experts are constantly solving major Shuttle problems, such as: strength of resistance versus mass velocity—and, the results of their efforts is expressed in the eyes, the tips, the grips and numerous other features which always enable Southern Shuttles to set new performance records regardless of the speed of the looms.

Modern Mills . . . Modernize with "Southern"—
the Shuttles that "Weave the World's Needs."

108 SERIES

STEEL HEDDLE MFG. CO.
2100 W. ALLEGHENY AVENUE PHILADELPHIA 32, PA.
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SOUTHERN SHUTTLES Paris Plant, Greenville, S. C.
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STEEL HEDDLE COMPANY OF CANADA, LIMITED
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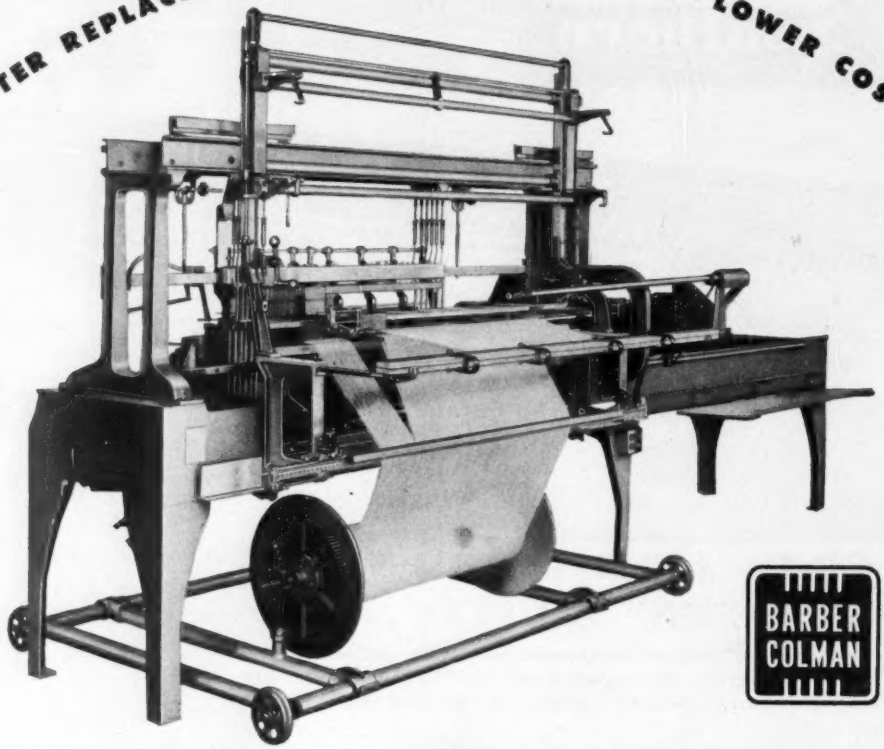
FASTER REPLACEMENT • STRAIGHTER WARPS • LOWER COSTS



BARBER COLMAN

BARBER-COLMAN MODEL D *Warp Drawing Machine*

The Model "D" Barber-Colman Warp Drawing Machine is especially suited for wide sheeting mills or other mills that rarely use more than six harnesses and not more than four banks of drop wires, and that have a high percentage of drawing-in due to changes in width and quality of material.

HARNESS FRAME LENGTHS	
Size of Machine	Maximum Overall Length of Harness
48	54"
66	72"
86	92"

Field reports show up to 4600 Ends per Hour
Will draw warp from 10 to 300 ends per inch
Will draw from either flat sheet or 1 x 1 lease
Will draw from single or double beam or split sheet
Will draw 1 x 1 lease in Double Beam or Split Sheet

Draws ends through drop wires, heddles and reed all in one operation. This machine will draw practically any type of draft, either complicated or simple, with the same speed and accuracy.

MACHINE CAPACITY: Reed, 6 Harness, 4 Banks of Drop Wires
DROP WIRE CAPACITY: 9/32" through 3/4" wide

WILL DRAW

- Cotton Yarns
- Filament Yarns
- Spun Yarns
- Woolens and Worsteds
- Monofilaments

AUTOMATIC SPOOLERS • SUPER-SPEED WARPERS • WARP TYING MACHINES • DRAWING-IN MACHINES

BARBER-COLMAN COMPANY

ROCKFORD • ILLINOIS • U. S. A.

FRAMINGHAM, MASS., U. S. A. GREENVILLE, S. C., U. S. A. MANCHESTER, ENGLAND MUNICH, GERMANY

able from The Textile Institute, 16 St. Mary's Parsonage, Manchester 3, England.

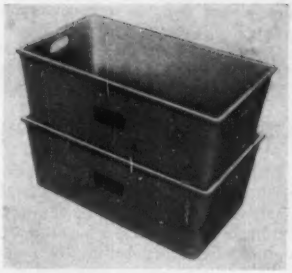
Small, Portable Steam-Jet Cleaner

The JC-10 "Speedylectric" steam-jet cleaner requires only 18" x 14" floor space, and can be maneuvered through narrow aisles. It weighs less than 100 lb and is equipped with 8" rubber-tired wheels to provide maximum portability. Device uses steam from the built-in high pressure boiler. It is free of low water danger since boiler water itself is the electric resistance heating element.

Livingstone Engineering Co., 100 Grove St., Worcester 5, Mass. (C-209).

Labor Relations Manual

A new manual, "Labor Relations Work Kit," has been published by the National Formen's Institute, Inc., New London, Conn. (price, $7.50). It is designed to acquaint the labor relations and personnel man with some of the more successful techniques worked out by other companies that have, when faced with a particular problem, come up with a workable solution. Over 200 pages.



Bobbin box molded from Fiberglas. (Westport).

Molded Bobbin Box

A recently marketed line of bobbin boxes features sturdy, one-piece molded construction with smooth inside finish, and rounded inside corners. According to the manufacturer, they are permanently colored and very light.

Available in five standard sizes, the boxes can be supplied for self-stacking or nested.

Westport Fibre Corp., Westport, Mass.

For additional data, request item C-110, using business reply card on page 230.

NEW Equipment AND MATERIALS

New Type Carpet Racks

A recently developed method of handling and storing floor coverings in rolls or cartes utilizes unique bed-type roller shelves that permit carpet rolls to be rolled into "slots" from a specially designed dolly truck. Sheets of plywood are used as trays to lend support to the bagged rolls. Slot openings are available in various sizes, a 27" x 27" x 12' slot being standard. Racks are prefabricated and shipped "knocked down" to afford greater flexibility to changing warehouse conditions.

Equipment Manufacturing Inc., 21599 Hoover Road, Detroit, Michigan (C-201).

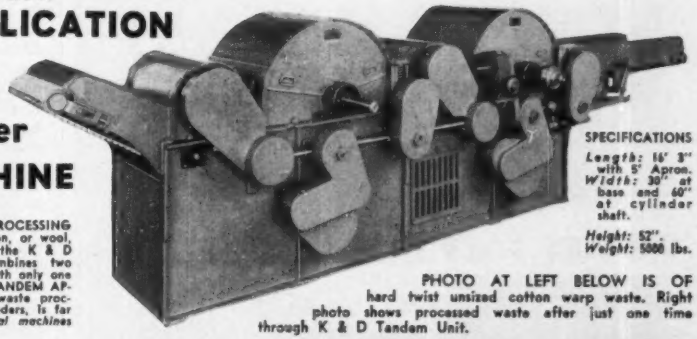
Three-Phase, Dry-Type Voltage Regulators

To meet the industrial demand for regulated three-phase power at low voltages, a complete new line of three-phase, dry-type, induction voltage regulators is available. It in-

You Can Now Whip the "Hard Waste" Problem

with this new

TANDEM APPLICATION of the K&D Single Cylinder WASTE MACHINE



DESIGNED TO MEET THE NEED FOR PROCESSING unsized "Hard Waste" in cotton, rayon, or wool, this new TANDEM APPLICATION of the K & D Single Cylinder Waste Machine combines two single-cylinder units in one housing, with only one feed apron and one exit apron. This TANDEM APPLICATION, providing double-action waste processing on each of the unit's two cylinders, is far *more efficient than bulky, conventional machines with four cylinders.*

SPECIFICATIONS
Length: 16' 3" with 5' Apron.
Width: 30" at base and 60" at cylinder shaft.
Height: 52".
Weight: 5000 lbs.

PHOTO AT LEFT BELOW IS OF hard twist unsized cotton warp waste. Right photo shows processed waste after just one time through K & D Tandem Unit.

THE MILL* WHICH SENT THE "HARD WASTE" SAMPLE shown at right ordered one K & D TANDEM UNIT immediately after we ran their samples. They were so pleased with their installation that they have already ordered additional units!

*(NAME OF MILL ON REQUEST.)

BEFORE AFTER

WRITE, WIRE OR TELEPHONE for details of uses, cost, and installation of the new Tandem Application of the K & D Single Cylinder Waste Machine.

Kirkman & Dixon
MACHINE SHOP AND FOUNDRY
Greenwood, South Carolina

MANUFACTURERS OF K & D Single Cylinder Waste Machines, P-5 Hopper Feeders, in any width, Sargent Combs for Hopper Feeders.

cludes both self-cooled and forced-air-cooled regulators in standard 10% and 20% (raise and lower) ranges of regulation. Offered in ratings from 120 to 600 volts and from 12 to 85 kva. It is claimed that the three-phase winding on a single core makes possible a considerable saving.

General Electric Co., Transformer and Allied Product Div., Schenectady 5, N. Y. (C-202).

Feed Water Heater for Small Plants

A feed water heater designed specifically for small manufacturing plants, etc., with boiler capacities of 300 hp or less utilizes exhaust steam to heat the water before it is delivered to the boiler. Made of fabricated steel, it has specially designed stainless steel trays which disperse feed water in the form of thin curtains over a large area, so that exhaust steam gives up its heat quickly and evenly. According to the manufacturer, a saving of 1% in fuel will result from each 11 degrees F increase in feed water temperature by use of exhaust steam. No sump or hot well needed.

The Swartwout Co., 18511 Euclid Ave., Cleveland 12, Ohio (C-210).

NON-FLUID OIL
TRADE MARK REGISTERED

STOPS HEAT and WEAR in COMB BOXES

Ordinary lubricants can't prevent heat which usually means wear . . . they just can't stay in comb boxes. Cards lose adjustment due to play in worn bearings and uneven sliver gives you trouble right through the mill. NON-FLUID OIL prevents wear and protects card adjustments because it stays in bearings until entirely consumed. By remaining where applied, NON-FLUID OIL avoids costly damage from oil stains on goods in process and increases the life of card clothing by protecting it from becoming oil-soaked.

When used in comb boxes of cards, NON-FLUID OIL goes many times further than the very best grades of liquid oils—thereby preventing boxes from heating and minimizing wear on cams.

We are prepared to furnish mills with skilled engineering service. Write for Bulletin T5 T1 and free testing sample of NON-FLUID OIL.

NEW YORK & NEW JERSEY LUBRICANT CO.
292 MADISON AVE., NEW YORK 17, N. Y.—WORKS: NEWARK, N. J.

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DON'T YOU BELIEVE IT! If anyone approaches you with products they swear to be exact imitations of NON-FLUID OIL, at a lower price, don't you believe it! The basic factors in all industrial production preclude paying a little and getting a lot . . . Remember, you only get what you pay for!

NON-FLUID OIL is not the name of a general class of lubricants, but is a specific product of our manufacture. So-called grease imitations of NON-FLUID OIL often prove dangerous and costly to use.

Transfer Pump for Liquids

A high speed, air-operated transfer pump, designated the Speed-Flo Model 82230, empties a 55-gallon drum of S.A.E. 30 oil in slightly more than two minutes. It can be used for transferring lubricants, thinners, coolants, naphthas, non-corrosive chemicals, etc. Fits all 2" opening drums.

Lincoln Engineering Co., 5702-15 Natural Bridge Ave., St. Louis, Mo. (C-211).

A Practical Guide on the Textile Fibers

International Textbook Co., Scranton 9, Pa., recently published a book entitled *Textile Fibers* by L. E. Parsons, head of the Department of Textile Engineering at Texas Technological College, and John K. Stearns, director of the School of Textiles in the International Correspondence Schools. It is a practical guide on the subject, consisting of four parts: Part 1 deals with the cotton fiber, including such topics as cotton grades and sampling, staple length in grading, character of cotton, etc.; Part 2, Wool; Part 3, Man-Made Fibers; and Part 4, Yarns. (Price, $4.00).

Also, two new texts are available for students of International Correspondence Schools. These are "Throwing of Synthetic Yarns"—Parts 1 and 2, by Karl H. Inderfurth, formerly with Universal Winding Co. Prepared especially for home study of the subject, the booklets contain much worthwhile information. Part 1 is devoted to Soaking and Winding Operations; Twisting and Sizing are discussed in Part 2.

Dry Chemical Piped System for Fire Protection

Designed for automatic protection of industrial fire hazards such as loose textile stocks, a dry chemical piped system is operated by a heat-actuated device. When fire starts and

temperature increases, air expands within the heat actuated device. This trips a nitrogen cylinder release, pressurizing the dry chemical container. Dry chemical is then discharged through strategically located distribution heads onto the fire area. Automatic controls for closing doors, etc., can be added.

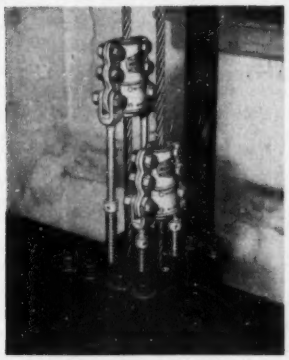
Ansul Chemical Co., Marinette, Wis. (C-214).

Preventative Maintenance Discussed in New Manual

A manual dealing with various phases of a preventive maintenance program was recently published by Professional Expediting Service, P. O. Box 224, West Hartford 2, Conn. ($2.00).

Elevator Safety Clamp

The Lucas Elevator Safety Clamp is a self-operating pressure clamp designed to give complete protection against elevator accidents occasioned by failure of babbitted sockets, bolts, and other connections at the points where wire ropes connect to the elevator car. Device does not replace the sockets. It serves as a protective device over the sockets and all shackle



Lucas safety clamps for rope type elevators. (Safety Devices).

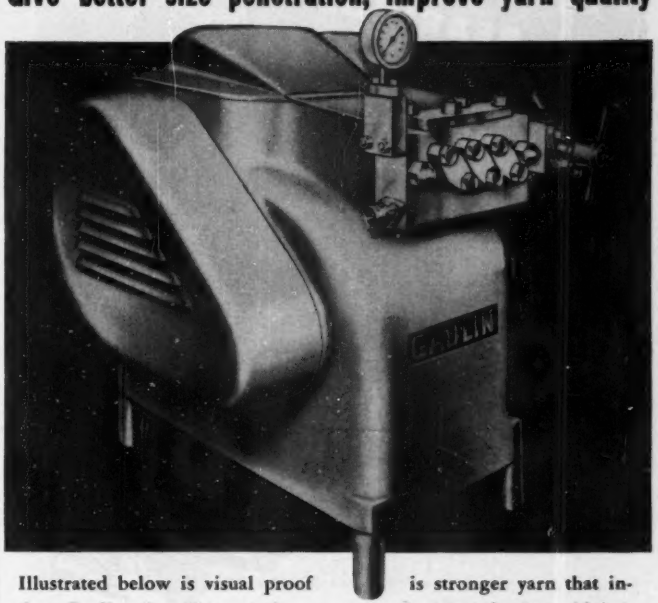
bolt connections. It operates only when a failure takes place. According to the manufacturer, the maximum distance that an elevator equipped with these clamps can fall should socket or bolt connections fail is only 1¼ inches. Other advantages: last lifetime; reduce necessity for periodic re-socketing (on all drum type elevators), thereby cutting wire rope replacement costs.

Safety Devices, Inc., Third National Bank Building, Springfield 3, Mass. (C-220).

Here's Proof that

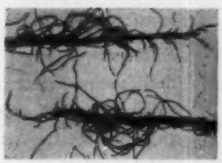
GAULIN HOMOGENIZERS

Give better size penetration, improve yarn quality

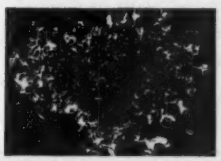


Illustrated below is visual proof that Gaulin size Homogenizers improve the quality of size, thus assuring better, more uniform size penetration into yarn. The result is stronger yarn that increases loom production with less rejects. In addition, Gaulin Homogenizers eliminate cooking time, providing still greater savings.

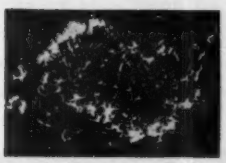
Photo micrograph shows break of homogenized single 60s yarn. Note the uniform lay of the fibres.



Break of 60s yarn coated with boiled size of same formulation. Notice the irregular break throughout.



Cross section of 28s with homogenized size. Size coating and penetration is uniform throughout.



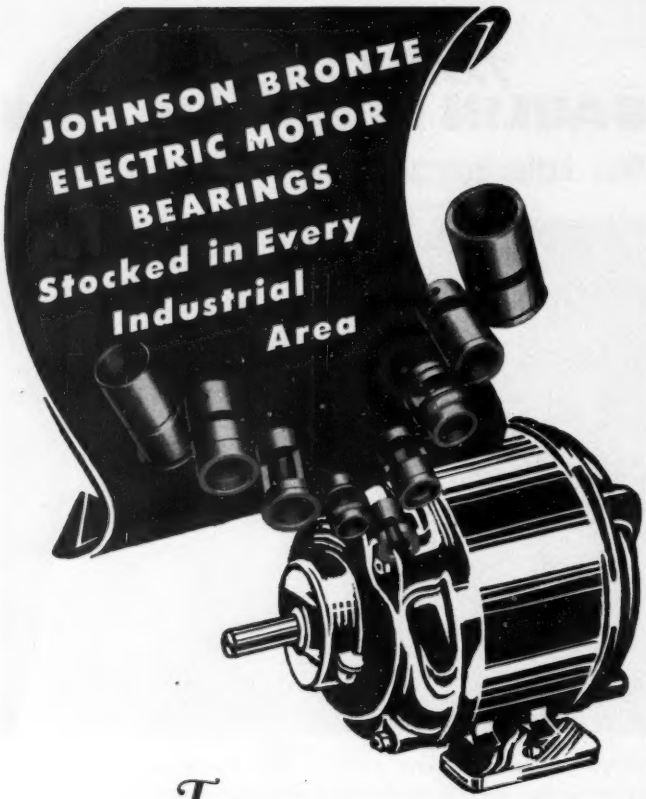
Cross section of 28s with boiled size. Note the heavy and thin size deposits.

Write for complete information on Gaulin Homogenizers, today.

Gaulin

Manton Gaulin Mfg. Co., Inc.

51 Garden Street, Everett 49, Massachusetts



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Exhaustive studies of each type of motor were made and leading motor repair shops were consulted. From this mass of information Johnson Bronze determined the correct alloy, the correct design and the correct tolerances for each individual bearing. Every Johnson Bronze Bearing is ready for immediate installation . . . completely finished, with flanges, oil holes, grooves, and slots, exactly to the requirements of your motors. For prompt delivery, call your local Johnson Bronze warehouse.

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NEW Equipment AND MATERIALS

High Velocity Unit Air Filter

The American Type HV high velocity unit air filter is made of corrugated strips of fine mesh wire in which corrugations taper so that when two strips are placed together they form a series of pyramid shaped pockets. The small ends of the pockets are closed to the air flow to eliminate any open air passages through the media. Designed to operate at velocities up to 500 fpm.

American Air Filter Co., Inc., Louisville, Ky. (C-216).

Safety Kit for Plants Utilizing Lift Trucks

Available for the asking is a safety kit for use in plants where lift trucks are employed for materials handling. Included are: four signs cautioning truck operators of blind corners, low head room, etc.; four safety posters; and an industrial lift truck operator's guide. Address Towmotor Corp., Cleveland 10, Ohio.

Wartime Difficulties

(*Continued from page* 107)

last war indicated that most projects of this sort employ from three to five times the number of people actually needed, and there is no reason to think that this particular one will be conducted any less extravagantly. Here again, the various textile industry associations might combine to urge upon their senators and representatives the necessity of conducting these defense activities on a serious, practical wartime basis instead of as money-distributing boondoggles.

This hydrogen bomb plant is, of course, only one of many defense projects which will toll presently employed people away from their jobs. They will be operating all over the country. These defense plants obviously must have employees, though not necessarily as many loafers as they habitually hire; and a very practical way of getting these employees, as well as of filling up the

ranks depleted by the draft, would be to lengthen the work week so that the people left in a plant after the unavoidable losses to the war can keep up the production. By following a suggestion* previously made in this magazine that any overtime payments made to these people should be collected by the government in taxes, we could maintain production and at the same time avoid inflationary price increases.

Some of the subsidiary effects of these labor shortages can be very destructive and disruptive. If working hours are lengthened and the punitive time and a half and double time rates are paid for the excess hours, a great deal of absenteeism will be encouraged just as it was in the last war. The memory of what excessively large wages can do to demoralize a working force is still fresh in the minds of many employers.

Employees who have been getting $50.00 a week and suddenly begin to make $75.00 to $100 will quickly drive prices up to the point where rationing will be necessary, and after rationing was imposed in the last war and people found it impossible to spend a lot of the money they made, a great many of them just quit trying to make it, and absenteeism aggravated existing shortages of help. The collection of all overtime payments as taxes should have a very steadying effect on the people.

During the last war a great many textile mills had employees leave to work in war plants where such high wages were paid that these employees could quit after working a few months, and come back home and loaf for a few months more. A good deal of this sort of thing was reported. The overly high wages paid in the war plants encourages absenteeism to an even greater extent than it is encouraged in ordinary manufacturing plants by excessively high wages. The general working conditions in many of these war industries are not as good as in settled manufacturing areas, and by paying people higher and

* "A Pork Barrel War," by Thomas Jeffries, Oct. 1950.

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Each maker of these machines had your best interest in mind when he built-in a Bijur lubricating system. Human carelessness and forgetfulness are eliminated by machines having built-in Bijur lubricating systems. These machines will never be shut down because they lack continous, proper lubrication. Make certain the machine you buy is furnished with a Bijur lubricating system.

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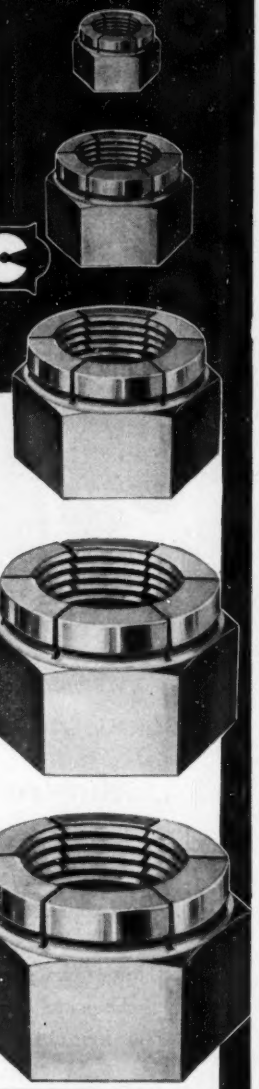

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It's because FLEXLOCs stay tight — simplify assembly, promote uninterrupted production and cut maintenance costs.

FLEXLOCs offer these features: *one-piece, all-metal* construction — nothing to work loose or forget, no serious temperature problems; *resilient, automatic locking sections,* processed by our patented method to provide FLEXLOC's closely controlled torques; and *ample, positive resistance* to the most chattering vibration, even after many applications.

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FLEXLOC Self-Locking Nut, "thin" type.

FLEXLOC Self-Locking Nut, external wrenching type.

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higher wages to compensate for these disagreeable working conditions, the people have to work less and less to get enough money for their needs. The idea of hiring people to work in these places is to get work done, and a good deal less work is going to be done if people are paid enough so that they only need to work a day or two a week.

Another thing that aggravates labor shortages is the constant competition of these defense plants with each other for workers. Recently, newspapers all over the East were carrying advertisements from Texas aircraft plants trying to recruit workers. These advertisements were a common sight during the last war when Texas plants would be advertising for help in the East, and eastern plants would be advertising for help in Texas and other western states. Instances were known where South Carolina workmen with an urge to see the country got transferred to shipbuilding plants in the Pacific Northwest and then to plants in Southern California, thence to New England, and so on; all trips with expenses paid. In order to entice workers to leave their jobs, these war plants, which were not affected by wage freezes, would offer constantly higher and higher pay, and a plant which was losing help would jack up its wages to stop the outflow and attract employees back, and the ultimate effect of this merry-go-round was to increase the number of floating workmen in the country; reduce the amount of work that got done; increase the cost of everything that was done; increase inflationary pressures on prices: and ruin these vagrants for any further useful purpose in life.

War is a desperately serious business, and this one is going to be particularly serious, because it catches us with a tremendous national debt, a tremendous degree of inflation, and the prospect of having to maintain a state of military preparedness for many years, rather than for just a relatively brief period while we are defeating the armed forces of an enemy.

What we *have* to do, we *can* do, but we must approach the task in a serious and determined manner.

What the TEXTILE MILLS are doing

An expansion program now under way at **Anchor Rome Mills, Inc.**, Rome, Ga., is expected to increase production 25%, according to a recent announcement made by P. A. Redmond, Jr. 48,000 sq ft of floor space not now in use will be remodeled, and 2100 sq ft erected, the new area to be used as a card room and picker room.

Flair Hosiery Mills, Inc., of High Point, N. C., has changed its name to **Acclaim Hosiery Mills, Inc.**, according to a recent announcement. The knitting mill at Hartsville, S. C., has been enlarged to take care of installation of additional knitting machines, which will give the mill a capacity of approximately 3500 dozen per week. Also, ten acres have been acquired adjoining the property, to allow for future expansion. J. Welch Harriss and J. Harriss Covington, president and secretary of the Harriss & Covington Hosiery Mills, Inc., hold similar positions in this organization, and W. W. Sharpe, Jr., formerly vice-president of Chadburn Hosiery Mills, is vice-president and treasurer.

Nolde & Horst Co., and all its subsidiaries were recently sold to Henri and Hilary Stakgold of New York. New officers of the firm are: Hilary Stakgold, chairman of the board; John H. Vogt, vice-president and plant manager; and Hans W. Nolde, vice-president.

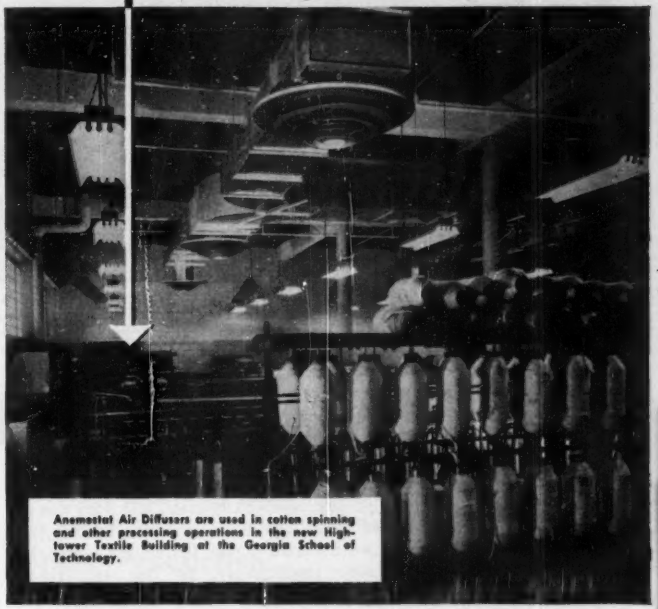
Plans are under way by Andrew and Nelson Vaughan, president and vice-president of **Vaughan Knitting Co.**, Pottstown, Pa., to open a half-hose plant in Spruce Pine, N. C. The operation will be conducted independently and not as a branch of the Vaughan Knitting Co.

Plans are under way for construction of an addition to the plant of **American Velvet Co.**, Stonington, Conn., which will provide 23,000 sq ft of additional manufacturing space.

The New Bedford, Mass., plant of **Firestone Tire & Rubber Co.**, previously offered for sale, has been withdrawn from the market, according to a recent report. Firestone has an-

ANEMOSTAT AIR DIFFUSERS

• put conditioned air where you need it



Anemostat Air Diffusers are used in cotton spinning and other processing operations in the new High-tower Textile Building at the Georgia School of Technology.

Scientifically designed Anemostat Air Diffusers accomplish this by distributing any volume of cooled or heated air in predetermined patterns . . . *without drafts.* Anemostats equalize temperature within the occupancy zone to plus or minus one degree and equalize relative humidity as well.

You can also use Anemostat Air Diffusers for spot cooling to neutralize machine heat loads. They are adaptable, too, to zone control of special areas. Anemostat's wide range of designs—including adjustable diffusers—assure flexible and perfectly balanced installations.

NEW BULLETIN 32 tells the full story on textile applications WRITE FOR YOUR COPY

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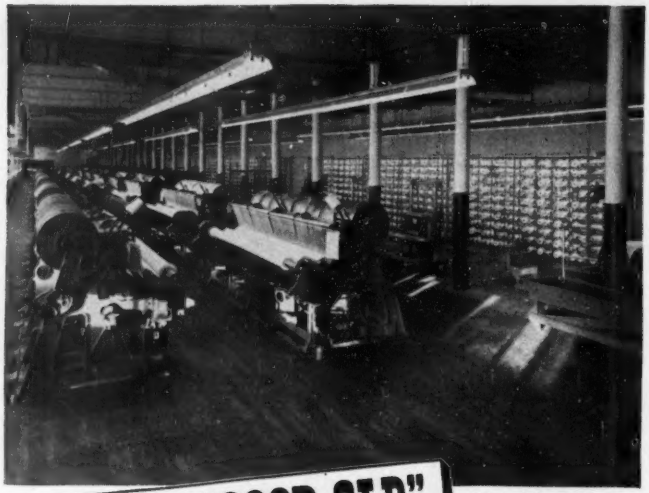

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Original floor of Northern Hard Maple, New Bedford Knitting Co., New Bedford, Mass.

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Strictly in the tradition of America's textile crafts, this New England mill floor was laid years ago with resilient, enduring Northern Hard Maple. Its builders turned, almost instinctively, to this splendid product of our native forests, secure in the knowledge gained through the experience of generations of textile manufacturers. They knew that good Northern Hard Maple is preferred for sound reasons. Its close grain structure offers no crevices; its pronounced stability of dimension makes for tight joints—hence little chance for dirt to lodge. Simple sweeping routine keeps it clean and attractive. It doesn't splinter. Its resilience resists dents. It's bright, light-reflecting, cheerful. It "feels good" under foot—workers prefer it. It *lasts* and *lasts* . . . and, come refinishing-time, "there's always a new floor underneath." If you're planning new or expanded mill facilities, be sure to specify MFMA-graded Northern Hard Maple. You know it's right in every respect. And it's available. And it's economical.

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Architectural, 13i/MA, for specifications and full data.

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CHICAGO 1, ILLINOIS

FLOOR WITH NORTHERN HARD MAPLE BEECH AND BIRCH

What the TEXTILE MILLS are doing

nounced that the mill would be retained for possible use in the production of essential war materials.

Carter Fabrics Operating Division of **J. P. Stevens and Co.** has announced that the tricot knitting machinery at its South Boston, Va., plant will be doubled shortly. The plant now has 12 high speed warp knitting machines. It was also announced that the South Boston plant recently completed 2,000,000 man hours without a disabling accident.

Eugene Hosiery Mills, 19 Woodrow Avenue, Sinking Spring, Pa., were recently chartered, with E. D. Blumberg, M. N. Blumberg, Herbert C. Blumberg, and Samuel L. Roberts as principal incorporators.

Utica (N.Y.) Knitting Co. has sold its mill in Oriskany Falls, N. Y., to the **Cascade Finishing Co.,** a subsidiary of the Lily White Sales Corp.

The woolen yarn spinning equipment of **Hartford Spinning, Inc.,** has been purchased by **Unionville (Conn.) Spinning Mills, Inc.** Hartford will henceforth concentrate on the processing of fiber stocks, synthetic yarns, and wool combing.

After rebuilding their plant, which was almost totally destroyed by fire over a year ago, **Martin Corp.,** Bridgeton, N. J., is back in production again. The new fireproof building contains approximately 36,000 sq ft, and new machinery has been installed.

Ansonia Mills have moved the machinery and equipment of the recently purchased Delite Fabrics Corp., Westerly, R. I., to their East Taunton, Mass., plant.

Max Furman, operator of the Ace Woolen Mills at Bridgeton, Maine, has purchased the **Belleville Woolen Co.,** North Kingston, R. I. The mill, renamed **Allenton Mills, Inc.,** will provide employment for about 150 people.

Alexander Smith & Sons Carpet Co. has plans for the erection of a carpet mill in Greenville, Miss., to be used for the manufacture of a new type Axminister fabric in both narrow and broadloom widths. The ar-

rangement calls for the building to be erected at a cost to the city of Greenville of over 4 million dollars, with the company investing around 3 million dollars for the necessary production equipment.

Contract has been let by **Raeflex Manufacturing Co.**, Red Hill, Pa., for a one-story and basement addition to the plant. The cost is reported to be over $100,000, with equipment.

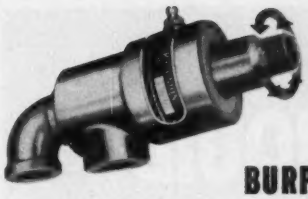
J. P. Stevens & Co., Inc., has announced that grammar school property valued at more than $355,000 was recently deeded to the Greer, S. C., school district by the **Victor-Monaghan Company**, a division of Stevens. The firm has also given two large tracts of land near Cedar Mountain, N. C., one to be used as a summer camp for deserving children of the county, the other for a recreational and educational center. Other announcements from J. P. Stevens include the sale by the **Appleton Manufacturing Co.**, Anderson, S. C., of most of the mill village's 395 homes, and the change in name of the former **Wallace Manufacturing** Co., Jonesville, S. C., to **Jonesville Mills.**

As part of the general expansion program of **Greenwood (S.C.) Mills**, two buildings in New York City acquired a year ago are being completely modernized. The buildings, located at 62-64 Worth Street and 31-33 Thomas St., will provide quarters of modern design and enlarged floor space, representing an investment of half a million dollars.

An addition to the **McCormick (S. C.) Spinning Mill's** worsted yarn plant, now under construction, will provide 87,000 sq ft to be used to process new synthetic fibers in conjunction with wool; also for warehouse space.

Riegel Textile Co., Trion, Ga., has announced that regular vacation pay will be given to employees in the military service; also that military leave of absence pay will be granted: one week's pay for those employed six months to a year, two weeks' pay for those who have worked longer than a year.

Bigelow-Sanford Carpet Co., Inc., has contracted to purchase the interest of the estate of Bernard R. Armour in Hartford Rayon Corp. Plans call for the supplementing of Hartford's present filament opera-



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When your stuffing boxes, packing joints, or steam joints go hay wire don't repair them. They cost you too much money in too many ways. You'll be money ahead by installing ROTARY UNIONS. Your records will soon show you substantial direct savings and indirect profits:

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You can't lose materials even under high pressures and temperatures because ROTARY UNION seals are lapped to .000,000,3" optical flatness. Sealed ball bearing construction permits continuous high speeds with savings of from 30% to 80% in power.

On Production

Flexible hose connections, "anti-wobble" shafts, special seal seats, heavy Monel bellows, silver brazing, and other superior construction features prevent operating failures and consequent down-time. High speeds increase production. Ball bearing construction prevents stretching of warps and reduces trouble in subsequent operations.

Write for Catalog 6001 showing how to cut your costs with ROTARY UNIONS. Expert engineering service is available at no obligation.

Type "S" used on Drying Cans

Slashers
Dry Cans
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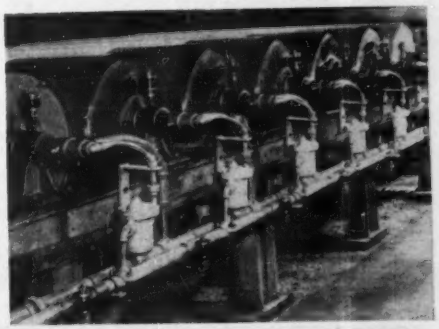
Sanforizing
Machines



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Getting your liquids where you want them in the right volumes at all times—*liquid control*—must be backed up by DEPENDABLE pumps! "Buffalo" clear water pumps and "Buffalo" chemical pumps have a reputation throughout industry for this kind of service. Extra heavy construction in every part—plus efficient design—are the reasons. Don't take a chance on the liquid control in your plant. Write for Bulletins 982, and 980-B—pick the RIGHT "Buffalo" Pump for any pumping need in your textile plant.

BUFFALO PUMPS, INC.
175 MORTIMER STREET BUFFALO, N. Y.
Canada Pumps, Ltd., Kitchener, Ont.
Branch Offices in All Principal Cities

What the TEXTILE MILLS are doing

tions by the manufacture of rayon staple suitable for carpets, according to James D. Wise, president of the firm.

Berkshire Knitting Mills have inaugurated a ten million dollar modernization program, which will include installation of a number of new-type knitting machines, seaming machines, and other equipment; also modernization of the various departments.

Zwicker Knitting Co., Appleton, Wis., recently moved into its newly completed building, which provides additional space for production units and storage.

The remodeled **Linn Mill,** Concord, N. C., purchased last year, will be in full production soon, according to Frank Lipe, mill executive. P. K. Dry, superintendent of the Linn and Corriher Mills in Landis, N. C., will be superintendent of the new mill.

Floor space of **Sanson Hosiery Mills, Inc.,** Philadelphia, Pa., was tripled when the firm moved into its new quarters, located at Franklin and Warren Streets, Allentown, Pa.

Construction of a rayon weaving mill near Burlington, N. C., is being planned by **Frank Ix & Sons,** to cost about a million dollars.

Spencer Mills Corp., Fort Plain, N. Y., has announced an expansion program which is expected to double the warp knit fabric output of the mill. Additional high speed machines will be installed.

A new hosiery mill, to be managed by J. K. Blake, Ellinwood, Tenn., has begun operation at Lavonia, Ga., in the manufacture of socks.

Plans for the merger of **Dwight Manufacturing Co.,** Alabama City, Ala., and **Cone Mills Corp.,** were recently announced. The addition of the Dwight mill will greatly expand operations of the Cone textile chain, which now has 500,000 spindles and 15,000 looms in its plants.

Eight additional tricot knitting machines have been installed by **Pennwood Mills, Inc.,** in their Egg Harbor,

N. J., mill. Sixteen more machines are to be added, to increase production of 15, 20, and 30-denier nylon tricot.

Cone Mills Corp., Greensboro, N. C., has plans under way for a new central laboratory building, as well as several other operating departments.

A two-million-dollar expansion project will be completed shortly at **Riverdale Mill**, Enoree, S. C., according to James A. Chapman, president. This is part of a move to convert the mill from coarse goods production to lighter goods.

International Braid Co., Inc. has completed negotiations for the purchase of the 24-loom venetian blind ladder tape manufacturing operation and the braid cord unit of the former Barnard Mill property in Fall River, Mass.

Springs Cotton Mills are planning a new warehouse at the Grace (S. C.) Bleachery, which will have approximately 100,000 sq ft storage space.

Burlington Mills Corp. has announced plans for doubling the size of its Wadesboro (N. C.) Hosiery plant. A wing will be added to the plant to house new knitting machinery and auxiliary equipment, and fluorescent lighting and humidification will be installed. Contract has also been let for a one-story addition to its Vamoco Mills, Franklinton, N. C.

A division for handling of defense work orders, to be known as the defense contracts division, has been established by **Bigelow-Sanford Carpet Co.** F. Albert Hayes, vice-president for purchasing, heads the division.

A new 10,000-spindle mill, equipped with machinery imported from Japan, recently began operations in Taipei, Formosa. Raw cotton will be obtained through the ECA.

Deering, Milliken & Co., Inc., have moved their women's wear department, woolen showrooms, sales offices, and Milium division to 1407 Broadway, New York, N. Y. The men's wear division remains at 261 Fifth Ave., and the main offices at 240 Church St.

Ramseur (N. C.) Worsted Mills, a subsidiary of **Guerin Mills**, Woonsocket, R. I., have under construction an addition to the plant, which

You CAN improve on a 95!

In skeet shooting, it takes an expert to break 95 out of 100 "clay pigeons"... but *champions* do better than *that*. They score 96, 97, 98, sometimes all 100, because they've given special, determined attention to the fine points of the sport.

In textile production, too, even *good* efficiency can be improved. For instance, it's entirely possible that a certain starch . . . perhaps even tailor-made to your own specifications...could contribute to an efficiency gain.

Why not call your Anheuser-Busch representative? He'll be glad to come and talk it over.

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GUMS
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Solving sizing problems does not represent to us a simple matter of supplying our products —it calls for expert analysis by men of our staff who are at home in the mills and who speak the language of technical knowledge.

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What the TEXTILE MILLS are doing

will enlarge its manufacturing facilities two and a half times, according to R. J. Fontaine, Jr., manager.

W. B. Dunn, president, W. H. Hill, vice-president, and J. H. Dunn, treasurer, are the officers of the newly established **Pachaug Mills, Inc.,** Norwich, Conn. The company plans to specialize in fine nylons and cashmere blends.

Land and buildings of **Lewis Knitting Co.,** Janesville, Wis., have been sold to **Borg Corp.,** Delavan, Wis. The property will be used by the Gibbs Division, producing precision instruments, making room in the Delavan plant for the fast-growing Borg fabric division.

Dyer Sold on Lab Steamer

(*Continued from page 93*)

several gallons of that expensive solution. A part, or possibly all, of the pigment pad solution is lost with every strike-off.

When the cost of the solution soars to two dollars a gallon, as it sometimes does on very heavy shades, every strike-off sends the cost of matching a shade spiralling upwards. Meanwhile, the use of that extremely valuable dye range equipment is costing labor and overhead as if it were running, even though it isn't producing a yard.

Under these circumstances any cost conscious executive would readily agree that anything that would reduce the amount of time spent matching a shade on the mill steamer would be very valuable indeed. The cost of the laboratory steamer along with the operator would have to be terribly high not to be worthwhile in a plant where shade matching for continuous steamer units is a problem. On the contrary, however, the unit is not very expensive, and the cost of the operator is paid for out of the labor and overhead savings resulting from his laboratory work.

In brief, we are sold on our laboratory steamer—would dread being without it.

Personal NOTES

ABOUT MEN YOU KNOW

Fuller E. Callaway, Jr., president of the Fuller E. Callaway Foundation, was recently elected president of the Georgia Tech Alumni Association. Among the directors of the association is **Julian T. Hightower**, president of Thomaston (Ga.) Mills.

Stephen A. McClellan resigned as president of the Institute of Textile Technology, Charlottesville, Va., effective February 3. Mr. McClellan is also president of Specialties, Inc., of Syosset, N. Y., and pressure of work in connection with the national defense effort has occasioned his resignation at the Institute. An executive committee has been appointed by the Board of Trustees to direct the Institute's program until a new president is selected.

At a recent directors meeting, **G. B. Heath, Sr.**, Chester, S. C., was elected president of Manetta Mills. **R. A. Willis, Jr.** was named general manager, secretary, and treasurer of the Monroe, N. C., plant, and **W. S. Simpson**, general manager, secretary, and treasurer of the Lando, S. C., plant.

In the only change of officers for this year, **J. Robert Bonnar** became a national vice-president of the American Association of Textile Chemists and Colorists. Mr. Bonnar is associated with General Dyestuff Corp.

R. Donald Harvey, general manager of the Lindale, Ga., division of Pepperell Manufacturing Co., was recently elected to the board of directors of the National City Bank of Rome, Ga.

W. D. Hurst, formerly superintendent of the Dalton, Ga., plant of American Thread Co., has been made general superintendent of all the company's mills in Georgia. Succeeding Mr. Hurst at Dalton is **J. D. King**, formerly assistant superintendent.

Fulton Bag and Cotton Mills has announced the election of three new directors, following the annual meeting of stockholders. These are: **Norman D. Cann**, attorney, of Washing-

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DRY-CLEANING
makes the difference!

What a contrast! An old, oil-soaked floor made 533% brighter ... safer than before ... and given a smooth, hard surface that resists dirt penetration —*all because it's dry-cleaned the* TENNANT *way.*

Gives you BRIGHTER, SAFER FLOORS ... AT LESS COST

Are there dark, slippery floors in your mill due to prolonged wet-scrubbing? Then check these advantages of the TENNANT System:

RECONDITIONS your floors. Fast, easy-to-use Tennant machine brings your floors to life again! Gets rid of dark, rough, oil-soaked fibers ... leaves floor bright.

HARDENS surface to resist wear. Special sealing process fills, binds and hardens wood fibers. Makes your floor resist dirt penetration ... prolongs floor life.

DRY CLEANS, eliminates scrubbing. A fast, one-man job ... with no mess or bother. Keeps floor lustrous, DRY, non-slippery. Enthusiastically approved by hundreds of mills.

WRITE TODAY for full information.

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TENNANT INDUSTRIAL FLOOR MACHINE

- Cleans floors, picks up soilage.
- Complete accessories for ALL your floor maintenance work.

Tennant Floor Machines have 12" or 16" revolving steel wool roll (or other accessory) that smoothly removes dirt and traffic stains. Very speedy and easy to use. Provides a smooth, dry, hard surface ... saves man-hours.

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The way to finer floors
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Floor Maintenance System
ESTABLISHED 1870

The Tennant System ENDS SCRUBBING

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Cab-operated electric hoist operating in conjunction with a single beam crane picks up the load *at the door*—delivers it directly to storage area. No re-handling. No aisle space or turning radii needed. Minimum head room required. Every cubic foot of space is put to work.

This is but one example of many applications designed by Shepard Niles specialists to reduce handling costs. Your problem may be different, but you can be sure you'll get the right answers from Shepard Niles—America's largest manufacturer of load-lifting and load-moving equipment. Write for Bulletin 130 today.

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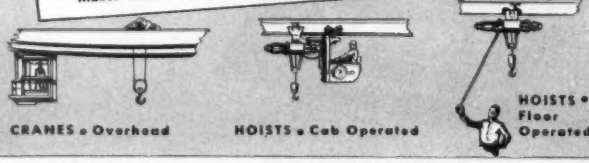
Makes and sells all three lifting tools for airborne shop loads



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Personal NOTES ABOUT MEN YOU KNOW

ton, D. C.; **E. Monroe Hornsby,** manager of the company's New York office; and **Frederic G. Barnet** of Dallas, Tex., who has been with the firm for 11 years.

Ernest A. Gsell, Gsell Textile Printing Corp., was elected president of the newly formed Association of Textile Screen Makers, Printers & Processors, Inc. **Keegan Yazdanian,** U. S. Textile Screen Engraving Corp., was elected vice-president; **Max Jacobs,** York Textile Printing Corp., treasurer; and **Irving D. Goodstein,** attorney, executive secretary.

Because of ill health, **G. E. Holden** has resigned as chairman of English Velvets, Ltd. **P. H. Hoyle,** vice-chairman and managing director, will succeed Mr. Holden, and **W. W. Grundy** will become vice-chairman and assistant managing director.

G. I. Davenport was recently elected to succeed G. Ellsworth Huggins, deceased, as president and director of Catlin Farish Co., Inc., as well as Henrietta (N. C.) Mills and Martel Mills Corp. **P. W. Siegert** succeeded Mr. Huggins as president of Catlin Yarn Co., Inc. and was made a director of The Henrietta Mills and Martel Mills.

Irwin Belk was recently elected to the board of Highland Park Manufacturing Co., Charlotte, N. C., succeeding his father. All officers and other directors were re-elected.

Paul McKenney, Jr., vice-president of Swift Manufacturing Co., Inc., Columbus, Ga., was selected by the Georgia Junior Chamber of Commerce as one of the "five outstanding young men of Georgia for 1950."

Native Laces & Textiles, Inc., has announced the appointment of **Walter P. Kuffler** as director of research and development. Mr. Kuffler has been vice-president of H. & F. Binch Co., Inc., a subsidiary of Native Laces.

At the annual meeting of stockholders of Wennonah Cotton Mills Co., Lexington, N. C., **W. E. Holt,** president for the past 33 years, was advanced to become chairman of the board, with **J. V. Moffitt, Jr.,** succeeding him as president and treasurer. **E. E. Riddle** was made vice-

president and secretary in addition to his duties as general manager.

Stanley Prokuski, formerly with Greenville (N. H.) Mills, is now assistant to Harry Baldwin, vice-president and general manager of the Brunswick, Maine, division of Verney Corp.

Julius W. Abernethy was recently elected to the newly created position of executive vice-president of Mooresville (N. C.) Mills, and **Gordon G. Matheson** was made a vice-president.

Carl C. Mattmann, who has been in charge of the fabric development department at Stonecutter Mills, has resigned from the firm. Details concerning his future plans have not been announced.

C. L. Hamilton has been elected president of Crown Cotton Mills, Dalton, Ga., and will continue as treasurer. **David Hamilton,** formerly secretary, has been named vice-president, and will remain as secretary.

G. E. Anderson has resigned as vice-president and sales manager of Galax (Va.) Knitting Co., Inc.

Arthur B. Borden has succeeded his father, the late General Howard S. Borden, as first vice-president of Borden Mills, Inc. He continues as treasurer.

James Bolton, formerly vice-president and general manager, has been elected president of Gosnold Mills, New Bedford, Mass.

Duplan Corp. has announced the election as directors of **John K. Cochran,** general manager of the firm's ten textile mills, and **Ralph B. Hood,** general manager of the Canadian affiliate.

S. D. Gardiner, formerly assistant treasurer, has been elected secretary of Fruit of the Loom, Inc., Providence, R. I.

John A. Shields, with Stehli and Co. for the past twelve years, has joined Textron, Inc., New York, N. Y., as director of fabric development and technical service.

James Lees and Sons Co. has announced some personnel changes, several of them due to the retirement of two vice-presidents, **John H. Halford** and **Earl B. Morgan, Sr. Spencer L. Jones** will direct the activities for purchases and sales of

Make Production lines

Logan Inclined Apron Conveyor in rayon mill, handles material to and from storage. This power conveyor is operated by a small, economical motor, and is reversible.

Productive lines

"Increased productivity" is the keynote of the day. Conveyors can help toward this end in more ways than one. Logan Conveyors (a) keep textile equipment operating at capacity (b) deliver work in process through spinning and weaving to operators at convenient working height (c) facilitate handling of incoming raw materials, and outgoing finished cloth. In performing the above services Logan Conveyors have "a good name" among the nation's foremost textile mills. Perhaps your plant, too, can benefit from Logan's two generations of conveyor engineering and manufacturing experience. Write today for more specific information or for the nearest Logan engineer to call.

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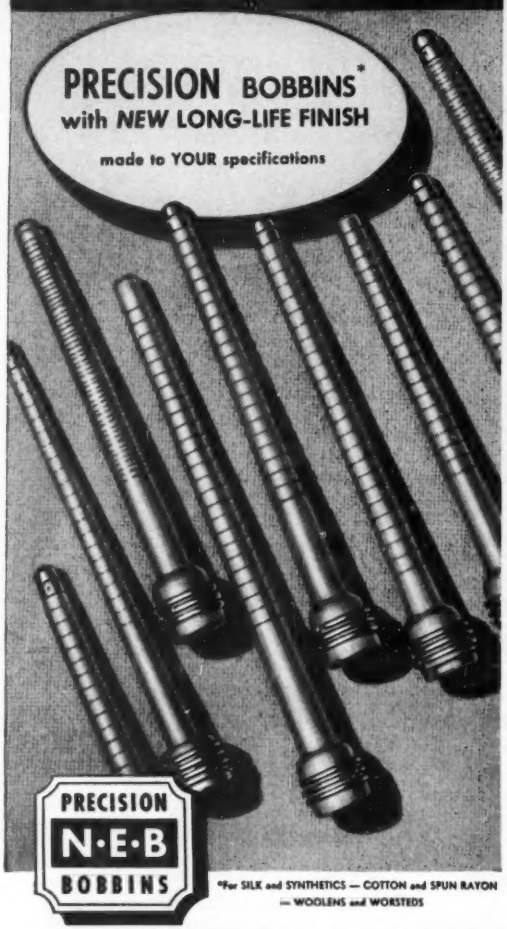
Precisioned to Size — Precisioned for Concentricity
Precisioned for YOUR Spindles . . .

For COTTON and SPUN RAYON



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Every NEW ENGLAND BOBBIN is tested for concentricity; for smooth, vibrationless running at high speed; to reduce spindle wear. The smooth New LONG-LIFE Finish developed by New England Bobbin & Shuttle Co. withstands heat up to 125°, chemicals in detergents, hard and continuous use. Lasts longer than conventional finishes. Include NEBs in your next requisition — your next order — and compare!

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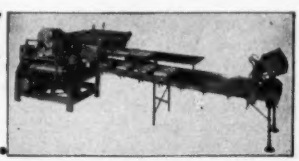

bulk worsted and hand-knitting yarn divisions and will be responsible for activities in the purchasing department. **Robert H. McFarland** is new purchasing agent. **Cruse Lewis** is now general traffic manager; **Frederick S. Nicholas** is director of industrial and public relations; **William L. Jarrett** succeeds Mr. Nicholas as personnel manager; and **Harold V. Dayton** will direct the activities in style and design, market research, and the advertising and promotion departments of the carpet division. In the engineering division, **Robert E. Oberholtzer** has been named coordinator of engineering, while **Robert J. McCann** was made chief industrial engineer.

Madison F. Cole was recently made general superintendent of Newnan (Ga.) Cotton Mills, with **Joseph H. Foster** taking over his former duties as superintendent of Mill No. 2. **Harry F. Taylor** continues as superintendent of Mill No. 1.

H. Stanley Worthington has been named to the new position of assistant to the vice-president of operations of Alexander Smith & Sons Carpet Co. Before coming to Smith, Mr. Worthington was with Columbia Steel Co. **M. M. Gannon** has joined the firm as industrial engineer.

The Association of Cotton Textile Merchants of New York has announced the election of **Saul F. Dribben** as chairman of the board. Mr. Dribben is president of Cone Export and Commission Co., Inc.

Warren A. Beh has been named general manager of the industrial fabrics division of Textron, Inc. Before coming to Textron, Mr. Beh was associated with E. I. duPont de Nemours & Co.

C. David Reich, formerly with Burlington Mills, has joined Reeves Brothers, Inc., as assistant to Thomas W. Oliver, Jr., in the synthetic fabrics department. Mr. Reich will be in charge of the development and promotion of new fibers and fabrics, with special emphasis on industrial and automotive end uses.

Frank L. Byrd, formerly with Dan River Mills and Mt. Vernon-Woodberry Mills, is now superintendent of the Caledonia Mills, Lumberton, N. C.

Sauquoit Silk Co., throwster in Scranton, Pa., has announced the election of **L. W. Schoelpple** to the newly-created post of vice-president.

Grenville R. Holden, formerly associated with Sylvania Electric Products, Inc., was recently named president of F. C. Huyck & Sons, Renssalaer, N. Y. Mr. Holden succeeded the late Francis H. Eldredge.

Dominion Textile Co., Ltd., Montreal, Que., has announced the appointment of **Harold A. LeDuc** as head of the newly named Magog Division. **Ernest Sewell,** former head of the Magog Print Works, was named technical director for Dominion, and **W. J. Pilton** takes over as superintendent of the print works.

Scottsboro (Ala.) Knitting Mill, Inc., has appointed **William E. Wolfe**

Personal NOTES ABOUT MEN YOU KNOW

LOGEMAN TEXTILE HOMOGENIZER

ENGINEERED AND DESIGNED SPECIFICALLY FOR
TEXTILE SIZING

HOMOGENIZED SIZE EFFICIENCY AT A NEW LOW PRICE

This new 1950 Logeman Textile Size Homogenizer is designed exclusively for textile manufacturers, to meet every specific requirement necessary in the preparation of superior warp size mixes.

Investigate this Logeman Textile Homogenizer now and let us prove to you its value and efficiency.

Write for complete details and prices

Southern Distributor
SOUTHERN SIZING COMPANY
ATLANTA 1, GEORGIA

ADVANTAGES OF THE LOGEMAN TEXTILE HOMOGENIZER

- PRODUCES UNIFORM SIZING AND CONTROLS SIZE VISCOSITY.
- REDUCES SHEDDING AND INCREASES WEAVING EFFICIENCIES.
- ELIMINATES SIZE COOKING AND REDUCES STEAM COSTS.
- SAVES TIME AND CUTS OPERATING COSTS.
- HEAVY DUTY — RUGGED DESIGN — SIMPLE ASSEMBLY WITH FEWER PARTS — CAPABLE OF CONTINUOUS HIGH PRESSURE OPERATION.
- PRESSURE HEAD CAN BE DISASSEMBLED FOR CLEANING AND REASSEMBLED IN 10 MINUTES.
- COMPACT DESIGN — LESS FLOOR SPACE REQUIRED THAN WITH OTHER HOMOGENIZERS.

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CLINTON Textile Starches are scientifically manufactured with unvarying uniformity assured. Clinton Starches give your warp the necessary body, strength and pliability that means quality weaving every time. For years Clinton has been a leader in the production of starches for all textile purposes.

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Opening Machines
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Press Roll Machines
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Since 1852

C. G. SARGENT'S SONS CORPORATION
Graniteville, Massachusetts, U.S.A.

as first vice-president, general manager, and a member of the board of directors. Before joining Scottsboro, Mr. Wolfe was associated with Union Underwear Co., Inc.

William N. Freyer, associated with the firm since 1946, has been elected executive vice-president of Bigelow-Sanford Carpet Co., Inc. The manufacturing, sales, purchasing, and products divisions will henceforth be under Mr. Freyer's supervision.

Earl Clifford was recently appointed executive manager of the Pontiac (R. I.) Finishing Plant of Fruit of the Loom, Inc., and **Edgerton Bloomer** was made production manager. **William Howson** was named production consultant to the president.

Roy M. Botts, formerly second hand for twisting, Plant No. 3, Stowe Mills, Inc., McAdenville, N. C., is now general overseer of carding and spinning on the night shift. **John Hunsicker** was promoted from night general overseer to overseer of spinning at the No. 1 plant on the first shift.

Formerly with the technical service department of the National Cotton Council, **Robert E. Stevenson** has been appointed textile technologist in the Washington, D. C., office of the U. S. Department of Agriculture's Bureau of Agricultural and Industrial Chemistry.

J. Harry Pfau, formerly in charge of mechanical research at Alexander Smith & Sons Carpet Co., has joined the research department at Bachmann Uxbridge Worsted Co.

George H. Hotte, of A. M. Tenney Associates, was made president of the American Association of Textile Technologists, with **Walter E. Scholer,** American Viscose Corp., and **Erb M. Ditton,** Gotham Hosiery Mills, being named first and second vice-presidents, respectively. **Bernice S. Bronner** of American Cyanamid Co., was re-elected secretary, and **Olen F. Marks,** Industrial Rayon Corp., remains as treasurer.

W. B. Pickard, formerly with the Corinova, Ala., mill of Textron, Inc., is now associated with Southern Leigh Textiles, Inc., Birmingham, Ala.

M. L. Thompson has resigned as president and director of Hillcrest Hosiery Mills, Inc., and Hamilton Hosiery Finishers, Inc., Durham, N. C., to take up duties as president of the new Thompson Hosiery Mills, Inc., Kinston, N. C. A battery of 60-gauge full-fashioned hosiery machines is being installed at the new mills for production of women's nylon hosiery.

Col. James V. Demarest, USAR, has been appointed special consultant to the Quartermaster General of the Army, with headquarters in the Empire State Building, New York, N. Y.

Personal NOTES ABOUT MEN YOU KNOW

Ralph E. Curtis, with Bates Manufacturing Co. since 1938, has been named general superintendent of all departments of the Bates Division with the exception of engineering, dyeing, and bleaching sections. **William P. Malloy** has been made assistant to the general superintendent, and **Joseph Leigh** has been made

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CAUSTIC SOLUTIONS · SIZINGS · TINTING-LIQUID VISCOSE AND CELLULOSE ACETATE · ETC.

NO PISTONS TO FOUL!
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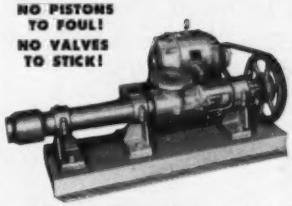

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Pumping troubles? End them *now* with long-lasting R & M Moynos—the pumps with *amazing* "progressing-cavity" action. They resist abrasives, chemicals—handle everything from liquids to pastes—keep going on the *tough jobs* where other pumps have failed.

MOYNOS DO THE IMPOSSIBLE—Moynos self-prime, pass particles and solids in suspension, deliver uniform flow and *positive* pressures to 1000 p.s.i. They won't cavitate or vapor-lock—reverse by reversing rotation—cut pumping costs in textile mills by sure, *low-maintenance* service.

Multi-stage units for higher pressures merely have longer rotor-stator pumping elements and, thus, more continuous seal lines over which pressure is equalized. Single-stage units have three seals.

CLEAN

Lubricant can neither contaminate or be contaminated in the Moyno. There are no bearings in the pumping compartment.

MORE ABOUT MOYNOS

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FULL RANGE ADJUSTMENT — The 5-Bar Expander, shown above, provides a quick, easy means of adjusting the amount of widthwise stretch in your material from minimum to maximum.

The 3-Bar Expander is very satisfactory when the various grades of materials being handled do not require so wide a range of stretching.

THE ENTIRELY MECHANICAL MOUNTING of the 5-Bar "Free Wheeling" Expanders and 1 four inch brass lead-on roll are all mounted in one bracket. The second and fourth expanders are vertically adjustable by means of hand wheels connected by a roller chain enclosed in tubes. Tubes are welded to frame and protect both chain and cloth from damage.

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overseer of Number 5 jacquard weaving department. **Fred J. Coggeshall,** superintendent of weaving and finishing since 1944, has resigned.

C. G. Jenkins, formerly assistant superintendent at Fairforest Co., Eagle & Phenix Division, Columbus, Ga., has been promoted to superintendent.

Obituaries

G. W. Felker, chairman of the board of Walton Cotton Mill Co., Monroe, Ga., died early in February.

After a long illness, **Hubert C. Milot,** vice-president of the M & F Worsted Mills, died in Providence, R. I. He was 62 years old.

Norbert H. Bachmann, 77, a co-founder of L. Bachmann & Co., now a part of the Bachmann Uxbridge Worsted Corp., died on January 2 in New York City.

H. M. Aderholdt, vice-president and assistant general manager of the Henry River Mills Co., Hickory, N. C., died recently of a heart attack. He had been associated with the firm since 1902.

Funeral services were held on January 19 for **Archibald C. Lineberger, Jr.,** 50, prominent Belmont, N. C., textile executive, who died unexpectedly after a three-day illness. Mr. Lineberger was president of Acme Spinning Co., vice-president of Knit Products Corp., and director of a number of mills in Belmont.

Forbert J. Bartholomew, 78, chairman of the board of Fletcher Works, Inc., and associated with the firm since 1898, died on December 27.

Paul A. Gobel, retired hosiery mill executive, died in Nashville, Tenn., after a prolonged illness. He was 44 years old.

On December 30 **Harry W. Callaway,** 66, a director of Callaway Mills, LaGrange, Ga., died after an extended illness.

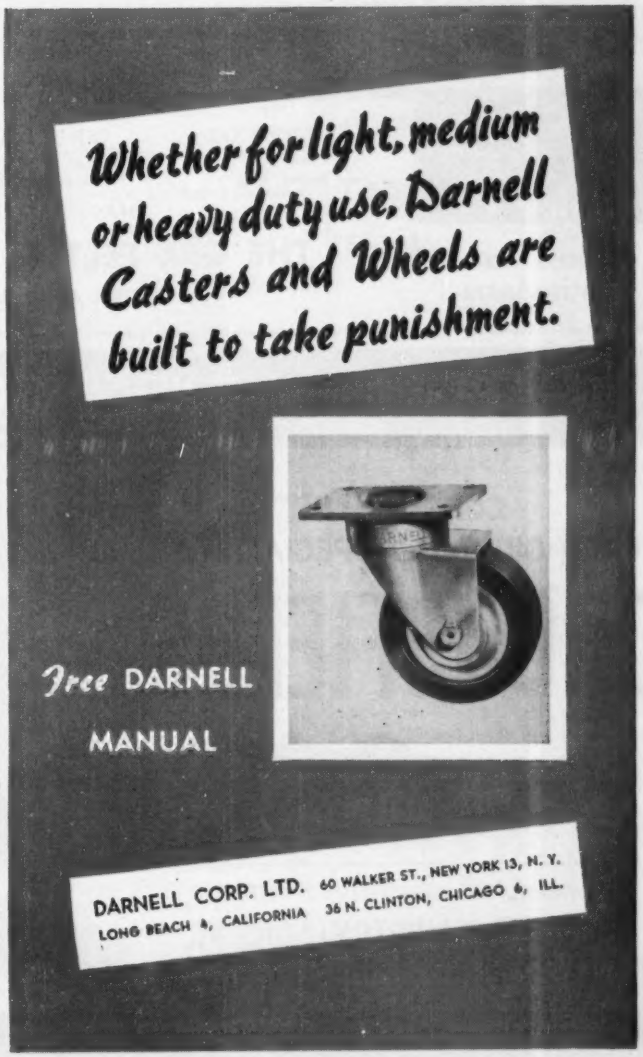
William A. Lang, who retired last year after 10 years as manager and agent of Bates Manufacturing Co.'s Edwards Division Mills in Augusta, died on January 21.

William A. Brownlee, of Appalachian Mills Co., Inc., Knoxville, Tenn., died recently. Mr. Brownlee was associated with the firm since 1928 and served as president from 1941 until last October, when he advanced to chairman of the board.

John N. Farrell, general manager of Defiance Bleachery, Barrowsville, Mass., and vice-president of Defiance Manufacturing Co., and Defiance Sales Co., of New York, died recently at the age of 41.

Personal NOTES ABOUT MEN YOU KNOW

At the age of 57 **Brig. Gen. Andrew D. Hopping,** Chief, Supply Division, Office of the Quartermaster General, died unexpectedly on January 11. General Hopping was appointed chief of the Supply Division in July, 1949, after two years as quartermaster in the Far East Command.


Whether for light, medium or heavy duty use, Darnell Casters and Wheels are built to take punishment.
Free DARNELL MANUAL
DARNELL CORP. LTD. LONG BEACH 4, CALIFORNIA
60 WALKER ST., NEW YORK 13, N. Y.
36 N. CLINTON, CHICAGO 6, ILL.

ORR SLASHER CLOTH

.... WITH SPECIAL CHEMICAL TREATMENT

SOMETHING NEW AND BETTER

Slasher Cloth is an important maintenance item in a cotton mill. With the introduction of ORR *Slasher Cloth with Special Chemical Treatment*, many of the problems which have pestered the slasher room foreman have been eliminated.

The slasher room foreman, in order to satisfy the superintendent and the cost department, must have available a *Slasher Cloth* which will:—

1. Dress the yarn properly.
2. Hold its width. No shrinkage.
3. Maintain level production performance.
4. Start fast—last long.

ORR *Special Treated Slasher Cloth* maintains uniform dressing properties, resists bacteria and steam degradation, maintains dimensional stability.

Discuss your *Slasher Cloth* problem with your ORR representative.

Industrial Woolens by Orr

STARTS FAST— LASTS LONGER

DISTRIBUTED BY

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279 Union St.
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718 Queens Rd., Charlotte 7, N. C.
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THE ORR FELT & BLANKET CO.

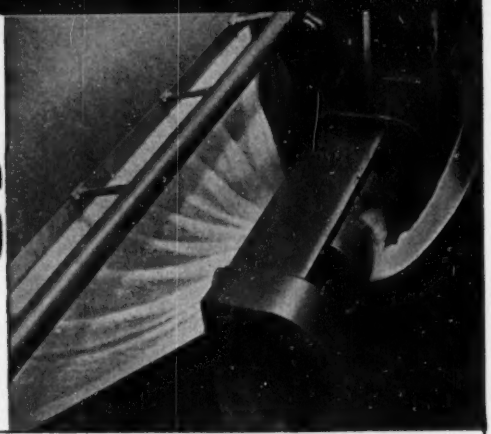
PIQUA, OHIO, U. S. A.

10.000.000 CARDING POINTS NEED PERFECT GRINDING ROLLS

CONSULT THE CARD-GRINDING SPECIALISTS

DRONSFIELD'S

TRAVERSE WHEEL GRINDER Nº 120



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JOHN HETHERINGTON & SONS INC.

BOSTON · MASS.

SOLID GRINDING ROLLER Nº 112

DRONSFIELD BROTHERS LTD · OLDHAM · ENGLAND

SUPPLIERS News

WHAT THEY ARE DOING

In addition to being executive vice-president of **Saco-Lowell Shops**, John S. Chafee has been elected president of **Pawtucket (R.I.) Spinning Ring Co.**, a subsidiary of Saco-Lowell.

William T. Wood, previously director of production of the **DuPont Co.'s** nylon division, has been appointed assistant manager of the division, in charge of Fiber V operations. He is succeeded as director of production by Charles E. Mears, whose former duties as manager of the nylon plant at Chattanooga, Tenn., have been taken over by Edgar H. Bleckwell.

Production is expected to be more than doubled at the East Spartanburg (S. C.) plant of **Draper Corp.**, with the installation of additional machine tools and up-to-date mechanized equipment in the foundry, according to a recent announcement. At present the plant will only manufacture repair parts and equipment for the southern mills.

The **American Cyanamid Co.** has announced the election of Raymond C. Gaugler as president, to succeed the late William B. Bell. Mr. Gaugler has served as executive vice-president since 1947.

Goodyear Tire & Rubber Co.'s new district office and warehouse at Wichita, Kan., was officially opened on January 10. R. N. Moore is the new district manager, with L. J. Harrer, district operating manager; E. O. Cooper, district credit manager; and D. D. Hutchens, district service representative.

Three branch offices and warehouses of **The Fafnir Bearing Co.** have been moved to larger, more modern quarters. The Charlotte, N. C., branch is located at 119 West 29th St.; 3334 West Newport Ave. is the new address of the Chicago branch office and warehouse; and the Cincinnati sales office is now at 920 E. McMillen Street.

A. P. Hall, vice-president and general manager of sales for **American Chain & Cable Co.**, was recently appointed a member of the board of directors for **Walter Kidde & Co., Inc.**

Emery Industries, Inc., have announced direct sales and technical service coverage of the West Coast area for the complete line of Emery chemical products, with L. J. Hadobas in charge. Their newly established branch office is located at 420 Market St., San Francisco 11, Cal.

John N. Gammon has succeeded the late George H. Small as southern district manager for **Nopco Chemical Co.**, with headquarters at Cedartown, Ga. Mr. Gammon has been with the organization since 1931.

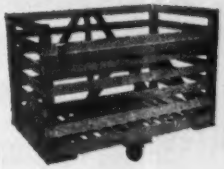
Mr. Gammon

Flexible Tubing Corp. recently opened its new $100,000 plant at Guilford, Conn. This new plant will increase production capacity threefold, according to the company's president, Frederick K. Daggett.

Elmer J. McVey, formerly with H & B American Machine Co., has joined the sales organization of **Saco-Lowell Shops** in Boston, Mass.

A new marketing department, under the direction of Frederick T. Keeler, has been established by **The Carborundum Company** to bring together all related staff functions of marketing, including market research, advertising, sales promotion, and public relations. Arthur Batts, Jr., will be manager of the department, with Arthur W. Cowles as advertising manager and E. Dent Lackey as public relations manager. Lewis P. Mer-

Insure Against Rust and Snagging



with EXCEL No. 600 Slatted Conditioning Trucks

Brass screws and cadmium plated bolts eliminate any possibility of rust. Because they are fastened from the outside they also insure against snagging. The Excel No. 600 is constructed of highly polished cypress or maple and finished with two coats of heat and acid resistant Tropelite to form a durable snag-proof surface. Slatted sides, ends and bottom permit perfect saturation and drainage.

Casters are securely bolted to bottom of truck.

Representatives:

Mr. W. N. Eurey.....Lincolnton, N. C.
Mr. Paul Eurey.....Lincolnton, N. C.
Industrial Suppliers, Inc.
La Grange, Ga.
Fall River Mill Supply Co.
Fall River, Mass.
Mr. Theodore Huston
2601 N. Broad St., Philadelphia, Pa.

EXCEL

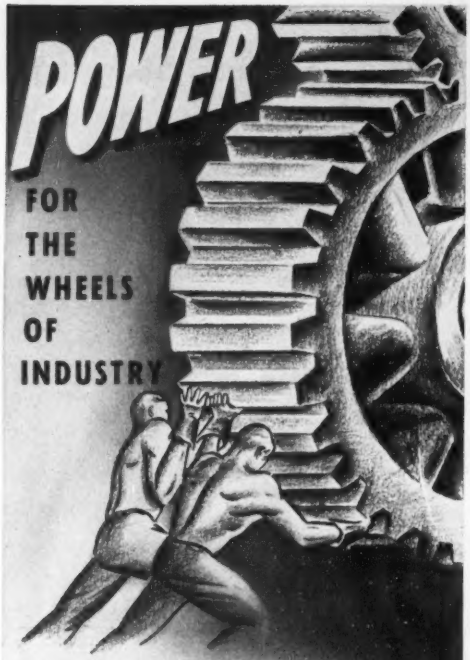
Textile Supply Co.

"Excel Trucks Excel"

LINCOLNTON, NORTH CAROLINA

POWER

FOR THE WHEELS OF INDUSTRY



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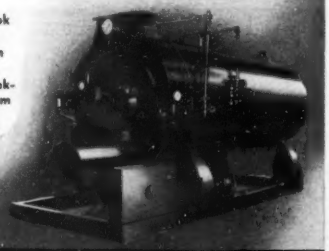
CLYCLONIC COMBUSTION

No high powered advertising statements are necessary. Write for PROOF why Cyclotherm Steam Generators will give you:

- Lower installation costs
- Up to 50% savings on maintenance costs
- Quicker heat
- Cleaner plants
- Lower fuel bills

Boilers are designed for oil or gas operation from 18 thru 500 h.p., 15 to 200 lbs. operating pressure.

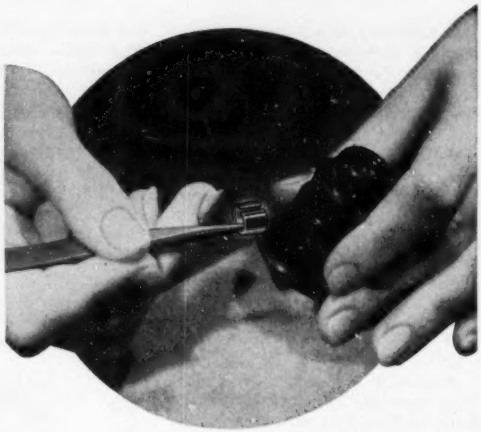
Your phone book will give you your Cyclotherm man's address. Or write for booklet on Cyclotherm Combustion to Dept. K.



CYCLOTHERM CORP., OSWEGO, NEW YORK

Every One –

SCIENTIFICALLY PERFECT



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... and in every box every traveler is exactly alike

This uniformity and quality of CARTER TRAVELERS is the result of years of experience, modern, precision machinery and exacting scientific control. The weight, temper and shape of every traveler is checked and rechecked by two trained technicians working in a modern metallurgical laboratory.

Scientifically, CARTER TRAVELERS are designed to increase yarn production at lower costs.

CARTER TRAVELER COMPANY
DIVISION OF
A. B. CARTER, INC.
GASTONIA N. C.

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R. D. HUGHES SALES CO., 2201 CEDAR SPRINGS, DALLAS 1, TEXAS
HUGH WILLIAMS & CO., 47 COLBORNE ST., TORONTO 1, CANADA

SUPPLIERS News
WHAT THEY ARE DOING

cer was appointed manager of sales promotion.

Eugene C. Gwaltney, Jr., formerly with Saco-Lowell Shops and Bibb Manufacturing Co., has become associated with **Robert & Co.**, Atlanta, Ga., as a textile engineer.

H. Thomas Hallowell, Jr., was recently elected president of **Standard Pressed Steel Co.**, Jenkintown, Pa., succeeding his father, who is now

Mr. Friel

chairman of the board of directors. Harold F. Gade, at present treasurer, also assumes the title of senior vice-president; J. Whiting Friel has been made vice-president in charge of sales, and William I. Kryder is the new secretary, succeeding Ralph H. Mast, retired.

Stanley J. Cartier, formerly in the Chicago office of the **Formica Co.**, is now representing the firm in the Carolinas. His office is at 118 Builders Bldg., Charlotte, N. C.

Andrew K. Kolar, formerly district manager at the Moline, Ill., plant of **Link-Belt Co.**, has been appointed assistant sales manager for the firm's Pershing Road plant products. Stuart T. Penick, heretofore district engineer at Dallas, Tex., succeeds Mr. Kolar as manager at Moline. Link-Belt has also announced the purchase of a 12,000 sq ft manufacturing plant near Johannesburg, South Africa, for the production of conveyor machinery and other products commonly used in South Africa.

H. C. Coleman has been appointed manager of **Westinghouse Electric Corp.'s** industry engineering departments, with headquarters in the East Pittsburgh divisions. He succeeds F. R. Benedict, who has been assigned new duties with the firm's Atomic Power Division. A new plant for the production of small electric motors will be built in Union City, Ind., and a plant for manufacture of Micarta will be opened in Hampton, S. C., according to announcements made by Westinghouse.

Guy L. Warden & Sons, formerly district representatives for **The Johnson Corp.** in lower California, have been made representatives for the entire state as well as several counties in Oregon. Offices are located at 209 West 12th St., Los Angeles, and 5200 East 12th St., Oakland.

M. Earl Heard, Jr., who majored in engineering physics at Alabama Polytechnic Institute, has joined **Southeastern Engineering Co.**, West Point, Ga., to do special work. Mr. Heard recently returned from Europe where he studied Continental methods of textile processing. He is the son of M. Earl Heard, vice-president and director of research of West Point (Ga.) Manufacturing Co.

Paul A. Duke, associated with **Atlantic Steel Co.** since 1948, has been named product engineer for that firm.

John M. Kane was recently appointed manager of the Dust Control

Mr. Kane

Division of **American Air Filter Co., Inc.** He has been with the firm since 1933.

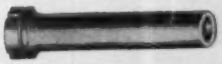
Singer Sewing Machine Co. has announced the promotion of H. C. Ernest, formerly assistant general agent, to general agent of its Atlanta manufacturers agency. Mr. Ernest has been with the firm for 26 years.

Industrial Brush Co., Inc., Little Falls, N. J., has completed additions to the plant which will triple the floor space and make room for installation of new equipment.

Markem Machine Co. has opened its new plant in Keene, N. H., consisting of two buildings, one housing

Buy

MONTICELLO



Card room bobbins with gun barrel finish inside and out; precision made to your specifications.

Warp spinning bobbins for high speed production and quality yarns . . . made from Hard Rock Maple.

Filling quills precision made from Hard Rock Maple.

All Dogwood Skewers.

MONTICELLO BOBBIN CO.

We are licensed to manufacture tubes for New Era Spindles.

The ONLY Independent Bobbin Manufacturer in the South

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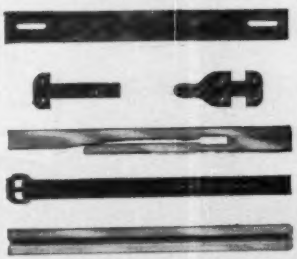
WHY BUY 3 or More Check Straps When Just 1 ABC HAIRON Will Do?

By actual tests one ABC HAIRON Check Strap has outlasted up to as many as six competitive straps.

Make a test in your mill . . . buy 100 lbs. of ABC HAIRON straps and 100 lbs. of straps from selected manufacturers. Have one loom fixer install all straps and keep accurate records.

ABC HAIRON will win out again!



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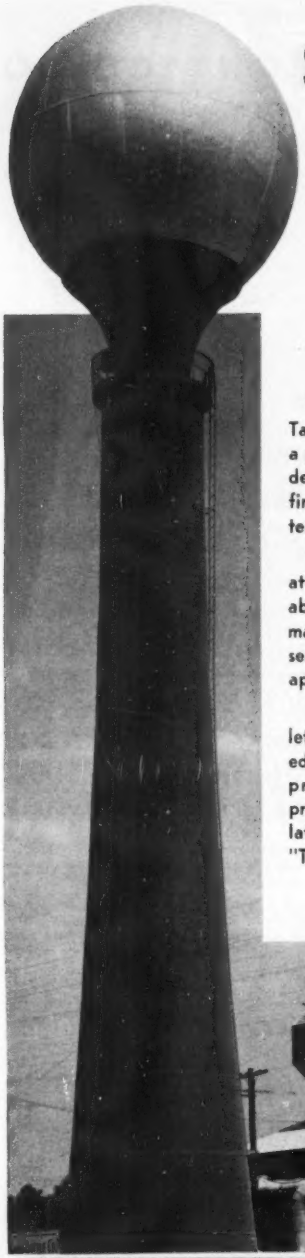
SPECIALISTS IN BUILDING STRAPS TO SUIT YOUR LOOM



SPHERICAL TANKS ON TUBULAR TOWERS

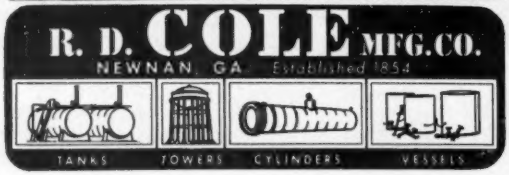
The COLE Spherical Tank on Tubular Tower is a pioneer in its field. We designed and erected the first tank of this character built.

This design provides an attractive and serviceable unit—economical to maintain, efficient in service and pleasing in appearance.

Write for special booklet on these modern welded Spherical Tanks which provide gravity water pressure, and for copy of latest COLE catalog—"Tank Talk."

•

R. D. COLE MFG. CO.
NEWNAN, GA. Established 1854



in card clothing, too..

height is important

For uniform carding and high production you must have card clothing with smooth, sharp points that are uniform in height.

You can be sure of these results with Wissco Card and Napper Clothing, because after the staples are accurately cut and precision-set, they are ground to an accuracy of ½ of a thousandth of an inch.

For consistently efficient performance, it will pay you to specify Wissco Card and Napper Clothing. We believe that after a trial order you will become a confirmed user. Why not write for detailed information and prices.

Sales Office and Plant: 56 Sterling St., Clinton, Mass.
Executive Office: 500 Fifth Avenue, New York 18, N. Y.
District Offices: Atlanta • Boston • Buffalo • Chicago Detroit • Denver • New York • Philadelphia.
Pacific Coast: The California Wire Cloth Corporation, Oakland 6, Cal.

Wissco CARD AND NAPPER CLOTHING

FOR COTTON, RAYON, WOOL, WORSTED, ASBESTOS AND SPECIALTIES

CF&I

A Product of Wickwire Spencer Steel Division of The Colorado Fuel And Iron Corporation

SUPPLIERS News
WHAT THEY ARE DOING

complete production facilities and offices for the manufacture of machines, printing elements, and supplies. The other building houses the ink division and facilities for research and manufacture of the Markem "King Markwell" and "Kemgo" inks. Open house was held on February 5.

Wilbur E. Combs was recently appointed product manager for the L. H. Gilmer division of **United States Rubber Co.**, according to a recent announcement. Mr. Combs will be responsible for sales of V-belts, shock pads, flat transmission belts, and other Gilmer products. He will make his headquarters in the Gilmer plant in Tacony, Philadelphia, Pa.

F. F. Jacobs, formerly with Aspinook Corp., has joined **Ciba Co., Inc.**, as director of research and development. Mr. Jacobs' headquarters are in New York City.

C. D. Sutton, Inc., has been appointed by **Eriez Manufacturing Co.** to handle the complete Eriez line in the Los Angeles area. All research and laboratory facilities on both permanent and electro-magnetic separation equipment will be made available through Sutton.

C. W. Bendigo, formerly with McGraw-Hill Publishing Co., Inc., has joined the **American Cyanamid Co.**, in the new products development department. Mr. Bendigo will advise on current developments in the field of synthetic fibers.

Harry Campbell has joined **Hemphill Co.**, Pawtucket, R. I., as director of public relations. He will be located at the Pawtucket plant, working directly with Benjamin R. Ebersman, vice-president in charge of sales. James McDowell, now southern sales director, will have charge of sales of Banner circular knitting machines throughout the South. His headquarters will be in the Security Bank Building, High Point, N. C.

A $2,500,000 plant for manufacture of industrial rubber products will be built by the **B. F. Goodrich Co.** near Marion, O. The new plant will have more than 125,000 sq ft of floor space. The company has also announced the appointment of A. Clarke Mack, Jr., to succeed J. Robert Thompson as manager of flat belting, including conveyor, elevator, and transmission. Mr. Thompson has been appointed manager of the Atlanta District for the division, succeeding Art Coffin, retired.

J. M. Pike, formerly with Ciba Co., Inc., has become associated with **Bernard Food Industries, Inc.**, Chicago, Ill. Mr. Pike will serve as field service representative for the company's food specialties, calling on mill cafeterias. Mr. Pike's headquarters are in Newnan, Ga.

William Iselin & Co., Inc., has announced the election of Hilmer Martinsen as a director of the firm. Mr. Martinsen has been with the company since 1932. Peter H. B. Cumming and E. Scott Macdermott were appointed vice-presidents, and Charles P. Yates is now assistant treasurer. Mr. Cumming now acts as contact officer for a group of the company's clients in the New England area, and Mr. Macdermott is business representative in that territory.

Mr. Cumming **Mr. Macdermott**

For customers who request that their newly-purchased Red-Ray burners be installed without delay, **Red-Ray Manufacturing Co.**, New York, N. Y., is shipping these units by commercial airlines, according to a recent announcement.

A new alumina plant near Bauxite, Ark., will be built by **Aluminum Co. of America**, to increase by nearly 50% the amount of alumina now being produced by the company. This is part of Aluminum Company's effort to make more aluminum available for America's defense and civilian needs.

Owens-Corning Fiberglas Corp. has under construction a new Fiberglas yarn manufacturing plant in Anderson, S. C. Production is expected to begin about the middle of the year.

John C. Koch, with **Conoflow Corp.** since 1945, has been made vice-president in charge of sales.

The EMBLEM OF QUALITY METAL SHIELDS
For Spools and Bobbins

Anderson Shields are dependable protection against chipping, splitting, and breaking of spools, bobbins, and paper caps. Even the most minute details are carefully worked out to make Anderson the highest in precision, the smoothest in finish, the best in performance. The Anderson Emblem is your assurance of the finest shields you can buy.

Insist on Anderson when you order metal shields.

TEXTILE SHIELD CO., INC.

J. N. ANDERSON, Treasurer

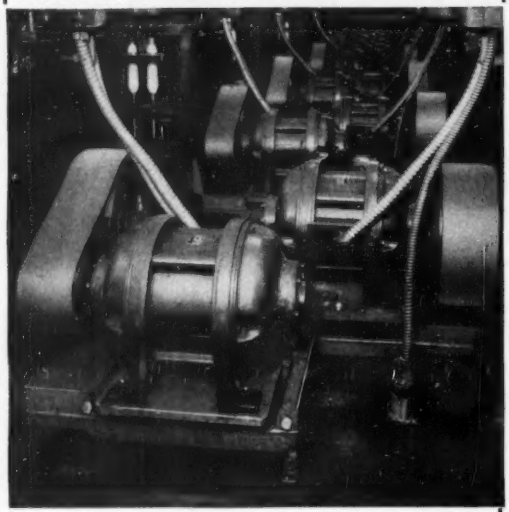
LAWRENCE, MASS., U. S. A.

High Co-efficient of Friction of...

RHOADS *Tannate* LEATHER BELTING

...means

MORE POWER DELIVERED plus INCREASED PRODUCTION



Higher production very often results from the installation of Tannate Belting on Textile Mill Drives. The unusual method of tanning used in making Tannate gives a combination of exceptionally good qualities superior even to high grade oak belting. With Tannate there is less slippage, less bearing tension, greater flexibility and a high resistance to oils, so, generally, Tannate will outpull and out-last other good belts. Many leading textile mills are constantly proving that Tannate Leather Belting assures greater production—uniform yardage—less spoilage—lower maintenance.

Send for complete information.

PRODUCERS OF FINE LEATHER FOR 249 YEARS

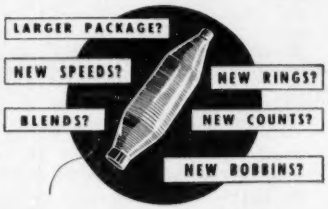
J. E. RHOADS & SONS

35 NORTH SIXTH ST., PHILA. 6, PA. and ATLANTA

U. S. RING TRAVELERS

What YARN changes are you making?

What TRAVELER changes will they require?



Wherever you feel a change in travelers would benefit, let U. S. men make suggestions and furnish test samples.

Prompt shipments from stock at Greenville, Providence

U. S. RING TRAVELER CO.

AMOS M. BOWEN, President & Treasurer

HOME OFFICE & FACTORY: PROVIDENCE, R. I.

SOUTHERN OFFICE & WAREHOUSE: GREENVILLE, S. C.

Write, wire or phone nearest office.

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O. B. LAND—Athens, Ga.—Box 1187—Phone 478
L. H. MELLOR, JR.—Mid-Atlantic States—123 Treaty Rd.—Drexel Hill, Pa.—Phone Hilltop 6-1563
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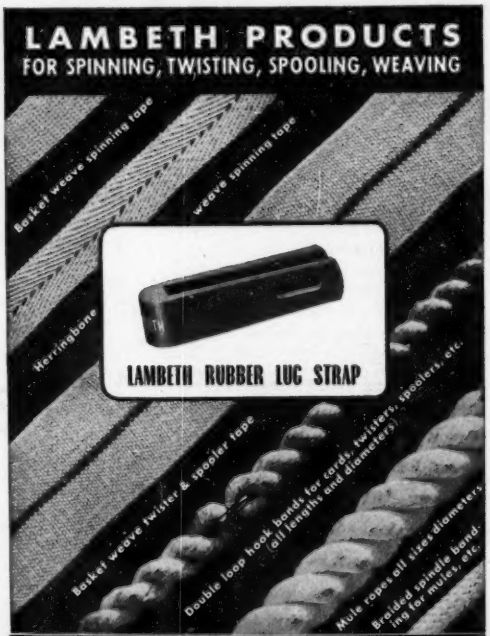
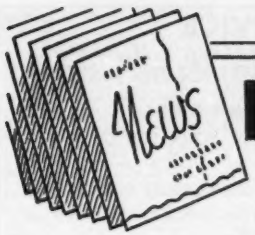
LAMBETH PRODUCTS

FOR SPINNING, TWISTING, SPOOLING, WEAVING


Basket weave spinning tape
weave spinning tape
Herringbone
LAMBETH RUBBER LUG STRAP
Basket weave twister & spooler tape
Double loop hook bands for cards, twisters, spoolers, etc. (all lengths and diameters)
Mule ropes all sizes diameters
Braided spindle banding for mules, etc.

LAMBETH ROPE CORPORATION

Plants at New Bedford, Mass. and Kings Mountain, N. C.



HELPFUL Booklets FREE

Here is the "cream of the crop" of literature on textile subjects as prepared by TEXTILE INDUSTRIES advertisers to aid in mill operation and management. These reference books and catalogs are free for the asking and there is no obligation involved. Read through the list carefully for booklet on the subject or new Equipment in which you are interested. Then fill in the numbers of those desired on the coupon on page 223 and mail it to TEXTILE INDUSTRIES. ("First Listings" shown below are not confined solely to TEXTILE INDUSTRIES advertisers).

This service is restricted to those engaged in operation and management of textile industries

First Listing of New Publications

3-1. Dust Control. Detailed selection, operation, and maintenance data for the plant engineer responsible for dust control is contained in a 50-page, digest size book—"Industrial Dust Control Through Exhaust Systems." Liberally illustrated with photographs and line drawings. Three major sections (1) Exhaust Hoods and Piping Systems, (2) Dust Collecting Equipment, and (3) Exhausters and drives.Pangborn, Corp., Hagerstown, Md.

3-2. Variable Speed Drives. New 12 page bulletin, G-509, which describes the basic operating principle of the Reeves Variable Speed Drives and contains representative rating tables and dimension drawings. The bulletin covers in condensed form, the three basic Reevesunits — Variable Speed Transmission, Vari-Speed Motodrive, Vari-Speed Motor Pulley—and a wide variety of manual and automatic controls for use with them. Reeves Pulley Company, Columbus, Indiana.

3-3. Ball Bearing Catalog. Selection of bearing type and size for various conditions of load and speed is simplified and illustrated by examples in new catalog which gives load rating tables for both radial and thrust capacities for all bearings, and speeds have been arranged to include those for synchronous motors. New Departure Div., General Motors Corp., Bristol, Conn.

3-4. Niaproof Water-Repellent Finishes. New bulletin describes how to apply Niaproof water-repellent finishes to clothing, rainwear, sporting and canvas goods, furnishings, linens and other textiles. Carbide and Carbon Chemicals Div., 977 Niagara Bldg., Niagara Falls, N. Y.

3-5. Instruments Accelerate Research—The acceleration of research through the use of industrial and related instruments and apparatus is the subject of an 84-page book which describes, for what is believed the first time, many types of equipment which, alone or in combination with other apparatus ,are being used in research and analytical studies. A ready reference and application guide for researchers and analysts, it also reflects the great strides made in the instrument field since World War II. Minneapolis-Honeywell Regulator Company, Brown Instruments Division, Philadelphia 44, Pa.

3-6. Studies of Wool Dyeing. "The Influence of the Cuticle in the Dyeing of the Wool Fiber" by H. E. Millson and L. H. Turl, was released as Calco Technical Bulletin No. 817. Important studies of the influence of the scale structure of a wool fiber on dye penetration, along with outlines of some results of experiments undertaken to obtain more uniform distribution of dye along the length of the fiber. Valuable to those interested in the chlorination of wool. American Cyanamid Company, Calco Chemical Division, Bound Brook, N. J.

3-7. Potato Starch Bulletin. Designed and written for layman and chemist, alike, this 4-page bulletin in convenient form for loose-leaf filing is the most comprehensive of its kind ever published and reveals heretofore unknown facts regarding the advantages, properties of potato starch and techniques applicable to modern textile processing. Morningstar, Nicol, Inc., 630 West 51st St., New York 19, N. Y.

3-8. Drum Spreader. Brochure describing the "Ezy-Apart" spinning frame drum separator and arbor remover which, according to the brochure, is designed to supply hydraulic force to spread the drums on spinning, twister and spooler frames and similar machinery. Removes bearing and connecting shaft without damage to the cylinder or cylinder head. Columbia Supply Company, Columbia, S. C.

3-9. Selvage Marking. Speedy, inexpensive identification of all textiles with dry, plastic pigment marking is described with the advantages and ease of operation of the Milford-Astor machine discussed. Illustrated with standard specifications given in table form. Milfa-Graph, Inc., Wilmington 99, Del.

3-10. Corrosion Control. Illustrated booklet on vinyl plastic coatings for the control of corrosion on exteriors of steel, concrete, brick, formed block and plywood structures and as a tank lining. Specific properties are given, along with a chemical resistance chart and information concerning application. Casey and Case Coating Co., P. O. Box 151, Maywood, Calif.

3-11. Cut-Out Couplings—New catalog 50A introduces the line of Anchor Cut-Out Couplings, which offer torque sensitive protection combined with the features of a flexible coupling. Describes these automatic devices which instantly shuts-off motor when an overload occurs. Resets itself automatically along with the flexible coupling type for direct connected drives. Anchor Steel and Conveyor Company, 6906 Kingsley Avenue, Dearborn, Michigan.

3-12. Production Increases. Illustrated booklet describing production savings through the use of Bellows "Controlled-Air-Power" Devices. Many uses described with the resulting savings given, along with engineering specifications and wiring diagrams. The booklet describes how many repetitive operations involving a pull, push or lift can be performed 30% to 500% faster, and with cost reductions ranging up to 50% or more, with Bellows "Controlled-Air-Power" devices. The Bellows Company, 222 West Market St., Akron, Ohio.

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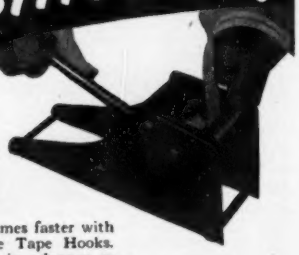

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Lace spindle tapes 10 times faster with Clipper No. 25 Spindle Tape Hooks. Tapes can be prepared in advance so frame is shut down only long enough to place new tape on the pulleys and join ends with connecting pin. Tapes run true—last longer—run smoother—require less tension—VIBRATION IS ELIMINATED

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4. HOW FACTORING CAN INCREASE PROFITS—Describes how factoring works out in keeping clients' capital liquid and attitude of factor toward checking credits, including typical balance sheet.—COMMERCIAL FACTORS CORP., New York City.

5. FACTORING AND FINANCING — Illustrated booklet on how factoring works, cost and credit information.—TEXTILE BANKING COMPANY, New York, N. Y.

7. RAYON TELLS ITS STORY TO THE PUBLIC—Folder containing reprints of advertisements explaining some of the many roles in which rayon is serving the American public. — AMERICAN VISCOSE CORPORATION, New York 1, N. Y.

8. "WASTE REDUCTION AND CONTROL"—19-page illustrated booklet giving primary waste factors; how to calculate cost of departmental waste; actual waste figures from mills; contains survey of waste practices. — SOUTHEASTERN ENGINEERING CO., West Point, Ga.

10. "LABOR AND MANAGEMENT BENEFIT BY INDUSTRIAL ENGINEERING PRINCIPLES"—8 page illustrated folder outlining principles of industrial engineering as they apply to textiles.—AMERICAN ASSOCIATED CONSULTANTS, INC., New York, N. Y.

12. CONDENSED LISTINGS—8 page pocket sized booklet listing by plant flow the machinery and mill supplies available. Designed to help purchaser in grouping his orders to greatest advantage.—ATKINSON, HASERICK & CO., Boston, Mass.

13. BROCHURE describing financial service to speed turnover of working capital; credit service for sales expansion and credit loss elimination.—WILLIAM IRELAN & CO., INC., New York, N. Y.

14. TEXTILE WEIGHT CONTROL—Forms 2009 and 2010, showing how Toledo Printweight weight records cut costs by eliminating human errors at the scales. Special purpose scales for the Textile Industry fully discussed.—TOLEDO SCALE CO., Toledo, Ohio.

15. FACTORING—Information available on how factoring works to aid client in keeping capital fluid and to avoid credit losses. Inquiries regarding these services welcome.—L. F. DOMMERICH & CO., 271 Madison Ave., New York 16, N. Y.

PLANT AND PLANT MAINTENANCE . . .

102. "TANK TALK"—Sixteen page booklet of illustrations showing various types of elevated steel tanks constructed and erected by manufacturers as well as stand pipes, reservoirs, storage and high pressure vessels, cylinders, along with helpful technical data. Also a list of what a few of the cotton mills say, said.—H. D. COLE MANUFACTURING COMPANY, Newnan, Ga.

103. HUMIDIFICATION, EVAPORATIVE COOLING—Bulletins available displaying AMCO automatic self-cleaning atomizers, controls, and evaporative cooling equipment.—AMERICAN MOISTENING CO., Providence, R. I.

105. DRY CHEMICAL—Brochure describing the Keefe fixed-system dry chemical fire extinguisher which is designed to control waste fires. Ideal for concealed areas where fires are likely to occur.—KEEFE AND COMPANY, Atlanta, Ga.

107. FINNELL SCRUBBERS—Illustrated leaflets describing and giving specifications for the Finnell floor scrubbing machines.—FINNELL SYSTEM, INC., Elkhart, Ind.

108. MAPLE FLOORING — Booklet describing finishing of Northern Hard Maple Flooring—list of M.F.M.A.-approved heavy-duty floor finishes. — MAPLE FLOORING MANUFACTURERS ASSOCIATION, Chicago 1, Ill.

109. CARD STRIPPER — Portable dustless card stripper described in bulletin 1099. Advantages of dustless stripping when combined with thorough brush stripping. Used alone or with other systems discussed.—PARKS-CRAMER CO., Fitchburg, Mass., and Charlotte, N. C.

118. "PARKS PARABLES" — Recent issue on Parks Turbo Traveling Cleaners for spinning, winding and warping. Type C.T.C. "Up Draft" cleaners keep overhead and ceilings free from fly and lint.—PARKS-CRAMER CO., Fitchburg, Mass.

119. MOPPING EQUIPMENT—Complete catalog and circulars containing information on the many sizes and styles that can be had.—S. C. LAWLOR CO., Chicago, Ill.

121. STEAM GENERATORS—Bulletin P-1 describes compact, package type boiler for heating, power, or processing. Described as fully automatic, firing all liquid or gaseous fuels.—THE CYCLOTHERM CORP., Oswego, N. Y.

123. STAINLESS STEEL TANKS — Bulletin CHR-50 illustrates the half round stainless steel horizontal jacketed tank with horizontal agitator and scraper blades, used for size cooking. Bulletin JS-50 shows various stainless steel jacketed tanks, and SS-50 shows single shell tanks.—METAL GLASS PRODUCTS CO., Belding, Mich.

127. SOLENOID VALVES—Bulletin "V" lists sizes from ⅛ inch to 3 inches; valves for normally open or closed service; stainless steel or Jenkins disc seats; three way solenoid valves, etc.; typical installations.—THE JOHNSON CORP., Three Rivers, Mich.

128. INSECTICIDAL PAINT—Bulletin describes new architectural type paint into which DDT crystals have been incorporated assuring insect control.—SONOCO PRODUCTS CO., Paint and Lacquer Div., Hartsville, S. C.

132. SANDING AND FINISHING—With Coated Abrasives. 32 page illustrated booklet on modern production methods, including information on the use of "Texalex" Cloth take-up roll covering and Fillet Cloth for sharpening cardcloth.—THE CARBORUNDUM CO., Niagara Falls, N. Y.

137. PUMPS AND COMPRESSORS—Bulletin P.Q.-11 presents the standard types of Gardner-Denver air compressors, pumps, and rotary drilling equipment (steam engines, steam and power pumps) in a brief and comprehensive manner to enable the prospective user to select the size and type for specific needs.—GARDNER-DENVER CO., Quincy, Ill.

142. ALUMINUM SCAFFOLDS—Circulars describing features of rolling scaffolds designed for use in weave rooms, spinning rooms, etc.—UP-RIGHT SCAFFOLDS, Berkeley, Calif.

151. INDUSTRIAL BRUSHES—Illustrated Booklet of industrial brushes featuring textile usage on shears, printing machines—also lock, raising and cylinder brushes.—M. W. JENKINS SONS, INC., Cedar Grove, N. J.

159. HUMIDUCT UNIT AIR CONDITIONING—Described in Catalog Section 4A. For humidifying, cooling, heating, ventilating or air filtering, in any combination.—THE BAHNSON CO., Winston-Salem, N. C.

162. MODERN METHODS OF TEXTILE FLOOR MAINTENANCE—Illustrated treatise on the history of floor cleaning in textile plants and a detailed description new methods for reducing floor cleaning costs as well as preserving textile mill floors.—G. H. TENNANT COMPANY, Minneapolis 11, Minn.

164. DRY SCRUBBING TEXTILE MILL FLOORS—With Holt combination Sanding and Steel Wooling machines and Sellig's Florseal-Florlene method. Literature describes system and reveals economy made possible by reduced costs in labor and material consumed.—THE SELIG CO., Atlanta, Ga.

166. AIR CONDITIONING BOOKLET. Twenty-page, illustrated booklet describing simplified procedures for effective cleaning and maintenance of air conditioning and humidifying equipment.—OAKITE PRODUCTS, INC., New York 6, N. Y.

173. BLOWERS AND EXHAUSTERS—Bulletin No. 2014-D describes types "E" and "RE" electric blowers and exhausters. Uses and full description of each with detail drawings.—BUFFALO FORGE CO., Buffalo 5, N. Y.

181. AIR FILTRATION AND DUST CONTROL—Booklet on atmospheric control, including engineering data on systems.—AMERICAN AIR FILTER CO., INC., 218 Central Ave., Louisville 8, Ky.

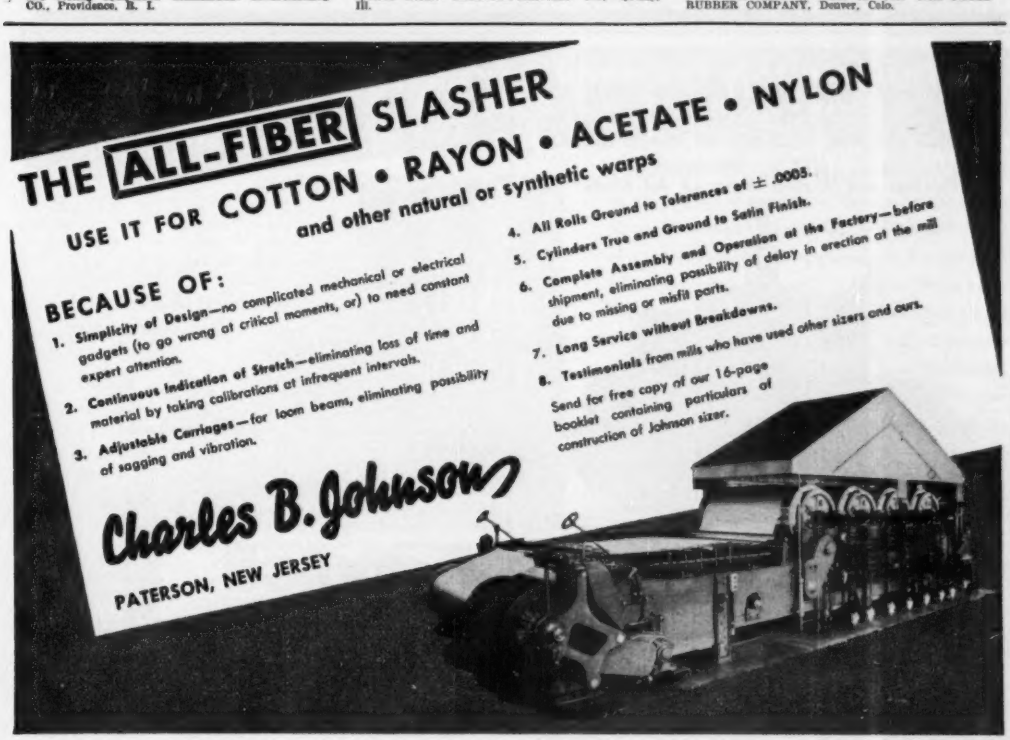
POWER TRANSMISSION, MOTORS, BELTING, LUBRICATION . . .

204. G-E MOTORS—Bulletin GEA-5338 contains information on the new line of life-time lubricated, unit-bearing FHP motors.—GENERAL ELECTRIC COMPANY, Schenectady 5, N. Y.

205. AUTOMATIC PRODUCTION CONTROL—Bulletin GN-457 on automatic speed control of many machines and processes through Variable Speed Equipment with mechanical and hydraulic automatic controls. Contains many illustrations, drawings and complete description of many applications.—REEVES PULLEY COMPANY, Columbus, Ind.

207. TRICO OILER INSTALLATION—Twelve interesting pages of actual "on the job" photos of Trico oiler applications on nationally recognized machinery and equipment.—TRICO FUSE MFG. CO., 2948 N. 5th St., Milwaukee 12, Wisc.

212. GATES TEXTILE ACCESSORIES—Showing the increased efficiency and economy to be secured through the use of Gates cone belts, comber belts, card bands and loom binder cushions.—THE GATES RUBBER COMPANY, Denver, Colo.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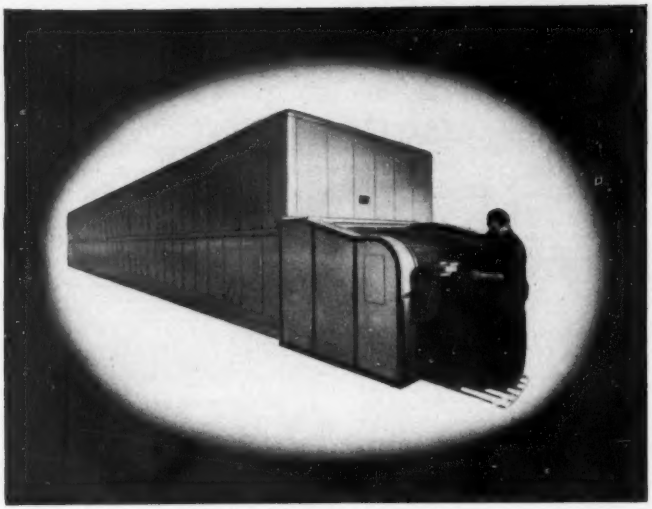

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In this modern, three-zone machine, the time required for the drying—cooling—and conditioning of yarn in the skein is greatly reduced, with resultant savings in labor and steam costs, and with increased uniformity in the processed product. Ideal processing conditions prevail at all times, regardless of outside temperature and humidity. Recent installations in leading Mills and Dye Houses.

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COOLING CHAMBER . . . Air is thoroughly circulated through the yarn at room temperature, in preparation for conditioning.

CONDITIONING SECTION . . . Special treated wood construction prevents condensation. Correct amount of moisture, for type of yarn, uniformly distributed through entire load. Temperature and humidity under constant, automatic control. All controlled elements instantly adjustable to various qualities.

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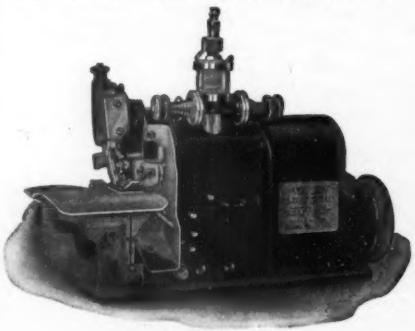

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Standard capacities: 60, 150, 300, 500 and 1000 gallons.

These stainless steel, fully-insulated SAN-I-TANKS . . . size cookers . . . dye tanks . . . are made especially for the textile industry, custom-built at standard prices for special or standard applications.

The new "CJ" is a vertical tank designed for maximum efficiency in minimum space. As with other SAN-I-TANKS, "CJ" can be equipped with top or side-entering agitators and other fittings and connections. Standard capacities: 60 to 1350 gallons.

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216. LEATHER BOOKLET NO. 202 — Attractive book illustrating and describing BONDABON Special Tanned Leather as used in various forms such as Check Straps, Solid Round Leather Belting, Flat Belting.—CHAS. BOND CO., Philadelphia, Pa.

218. BALL BEARINGS FOR TEXTILE MACHINERY—A 40-page catalog illustrating Fafnir Ball Bearing units for replacement or new applications in all phases of textile processing.—THE FAFNIR BEARING CO., New Britain, Conn.

220. MOTOR SELECTION—Booklet B-3075-C on different types of fractional horse power motors, and factors in selection of right motor for the application. Large chart gives complete data on small motors, horsepower, speed, torque, etc.—WESTINGHOUSE ELECTRIC CORP., Pittsburgh, Pa.

235. JOHNSON LEDALOYL BEARING BRONZE—Illustrated booklet telling the complete story of Johnson Ledaloyl Bronze, the newest development in self-lubricated bronze for textile bearings and bushings.—JOHNSON BRONZE COMPANY, New Castle, Pennsylvania.

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244. TEXACO SPINDURA OILS—Folder on lubrication for all types of spindles, based on actual tests.—TEXAS CO., New York City.

257. ONE-SHOT LUBRICATION OF TWISTER AND SPINNING FRAME—Illustrated booklet telling how Saco-Lowell builds in the Bijur central oiling system to boost production output and cut maintenance costs.—BIJUR LUBRICATING CORP., Rochelle Park, N. J.

263. NEEDLE ROLLER BEARING—Catalog Engineering and Application Data Edition 23A contains full data on selection of proper Needle Roller Bearings and outlines uses of such in various commodities including textile uses, types, installations, lubrication, etc.—TORRINGTON COMPANY, Torrington, Conn.

265. SERVICE PROCEDURE FOR BALL BEARINGS—Fully illustrated instructions on the right and wrong ways of dismounting, cleaning, lubricating and replacing ball bearings in any machine.—NEW DEPARTURE DIV., GENERAL MOTORS CORP., Bristol, Conn.

269. LUBRICATION AND MAINTENANCE OF BALL AND ROLLER BEARINGS—Illustrated bulletin describing efficiencies and economics of Non-Fluid oil for all types ball and roller bearings.—NEW YORK AND NEW JERSEY LUBRICANT CO., New York, N. Y.

275. HYATT ROLLER BEARINGS — A 16-page bulletin giving details of the application of roller bearings to all types of textile machinery.—HYATT BEARINGS DIV., General Motors Corp., Harrison, New Jersey.

277. VARI-PITCH DRIVE — Booklet describing this method of instant speed control covering most speed changing needs from 1½ to 40 H.P. Automatic Vari-Pitch sheave has been used successfully on all types of textile machinery. — ALLIS-CHALMERS, Milwaukee 1, Wisc.

281. ELECTRIFUGAL PUMP—Bulletin describing design and construction features of a close coupled pump and motor—available in ratings 10 to 500 gals per minute at heads to 220 ft. Other engineering data.—ALLIS-CHALMERS, Milwaukee, Wis.

283. CONTINUOUS OIL GROOVER — Bulletin available describing this unit which provides fast, accurate grooving on bearings of every size and type. Maximum production at a minimum unit cost discussed.—THE WICACO MACHINE CORP., Philadelphia 44, Pa.

290. MOYNO "PROGRESSING CAVITY" PUMPS—Bulletin 30-A describes the adaptability of these pumps to handling dyes, acids, sizing, and other materials used in textiles.—ROBBINS & MYERS, Pump Div., Springfield, Ohio.

INSTRUMENTS, STEAM SPECIALTIES . . .

300. TEXTILE DIGEST—18-page manual reviewing performances-proved procedures for improved handling of more than 60 essential cleaning and related operations in textile mills.—OAKITE PRODUCTS, INC.

301. JOHNSON ROTARY PRESSURE JOINTS—Bulletin describing the rotary pressure joint which requires no packing, no lubrication and no adjustment, giving installation and maintenance instruction, types, sizes, dimensions and prices. — THE JOHNSON CORP., Three Rivers, Mich.

302. INSTRUMENTS—Illustrated catalog covering uniformity analyser, acoustical measuring devices, and other non-destructive industrial measuring instruments. Illustrated brochure describing hypersonic equipment for both laboratory and pilot plant use in the field of ultrasonics.—BRUSH DEVELOPMENT CO., Cleveland 14, Ohio.

303. PROCESS CONTROL EQUIPMENT — Catalog containing brief description of standard and special process control equipment engineered for textile industry. Includes schematic diagrams. — MASON-NEILAN REGULATOR CO., Boston, Mass.

311. PIPING POINTERS—Industrial maintenance book covering installation and handling of piping, valves, fittings. Well illustrated, practical tips. — CRANE CO., Chicago, Ill.

314. MOISTURE CONTENT CONTROL — Bulletin F-3158 giving details of features and benefits of moisture equipment control for slashers and textile applications. — BARBER-COLMAN CO., Rockford, Ill.

315. CONTROL INSTRUMENTS FOR TEXTILE PROCESSES—32-page illustrated booklet describing controls for such process as slashing, dyeing, bleaching, kier boiling, drying, air-conditioning, etc. — MINNEAPOLIS-HONEYWELL INDUSTRIAL DIV., Philadelphia, Penna.

318. HYDRAULIC POWER UNITS—Literature describing hydraulic unit, motor, pump, reservoir, valving a small compact unit for operating of hydraulic calenders presses, hydraulic controls, etc.—B. F. PERKINS & SON, INC., Holyoke, Mass.

321. RED-RAY BURNERS — Bulletin describing use of Red-Ray Burners in preheating and partial drying to increase capacity of frame.—RED-RAY MFG. CO., New York, N. Y.

324. STROBOTAC—Informative reprint, "Strobotac Boosts Efficiency in Woolen and Synthetic Mills."—GENERAL RADIO CO., Cambridge 54, Mass.

326. RECORDING VISCOMETERS — Bulletin V-1000B, describing equipment for manual or automatic viscosity control of sizing operations in the textile field.—NORCROSS CORP., Newton, Mass.

329. COUNTERS — Leaflets describing Yardage Counters, Hank Clocks, Pick Counters—many types available for every make frame, loom, etc.—WAK INDUSTRIES, Charlotte, N. C.

330. TACHOMETER — Bulletin describes 200 models of indicating tachometers for permanent installation showing speeds in RPM's, yards per minute, feet per minute, etc., including portable (hand) tachometers. — JONES MOTROLA CORP., Dept. T.I., Stamford, Conn.

334. TEXTILE MILL INSTRUMENTS — Eight-page bulletin 98180 describes the use of automatic control instruments used on such processes as size cooking, storage kettles, size boxes, slashers, dye vats and driers.—TAYLOR INSTRUMENT COS., Rochester, N. Y.

335. WOOL AND WORSTED INSTRUMENTS—Bulletin 98199 cover the use of automatic control instruments for various processing equipment. Diagrammatic sketches and illustrations show eleven different control systems. — TAYLOR INSTRUMENT COS., Rochester, N. Y.

338. TEXTILE PRINTING COUNTERS—Catalog No. 75 illustrating and describing Productimeter Yardage and Printing Counters.—DURANT MFG. CO., Milwaukee 1, Wis.

CARDING, SPINNING, WINDING . . .

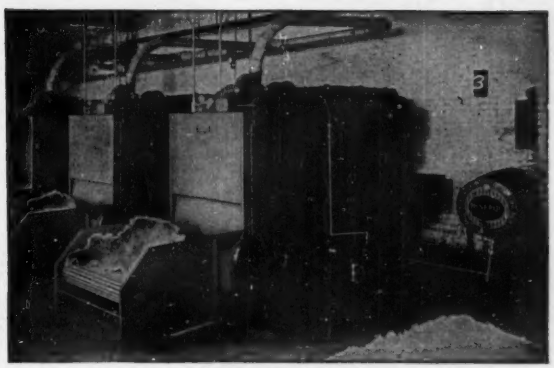
400. THE TRAVELER—Booklet on ring travelers published quarterly with a technical article on spinning and twisting of interest to mill men.—VICTOR RING TRAVELER CO., Providence, R. I.

401. LUMMUS DUSTLESS STEEL BLENDING FEEDERS—Bulletin describing automatically closing, positively locking door on feeders to prevent overloading, choking. — ALDRICH MACHINE WORKS Greenwood, S. C.

402. AUTOMATIC CLEANING AND OVERHEAD HANDLING FOR TEXTILE MILLS—24-page bulletin describing the American Monorail Automatic Cleaner for preventing accumulation of lint on spinning, twisting, winding and warping machines. Also for cleaning monitors and card room ceilings.—THE AMERICAN MONORAIL CO., Cleveland, Ohio.

403. WINDING MACHINES—Principles and Practices—This series available in booklet form for those in the industry who desire copies.—UNIVERSAL WINDING CO., Providence, R. I.

MINEROL FIRST and FOREMOST CONDITIONING AGENT for Textile Fibres.



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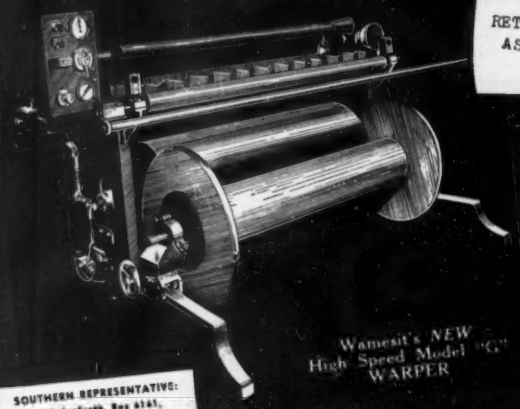

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The Wamesit Model "G" Warper will produce section beams of uniform density and maintain accurate control of end tensions throughout beam diameter build-up.

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- INTERMEDIATE DRESSER STAND FOR WOOLEN AND WORSTED
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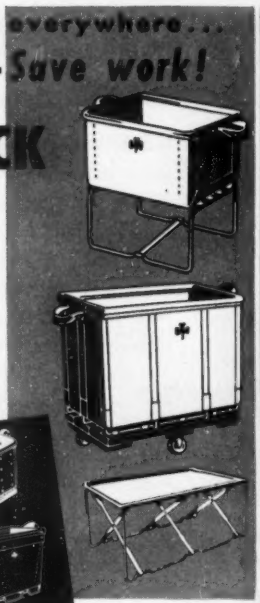

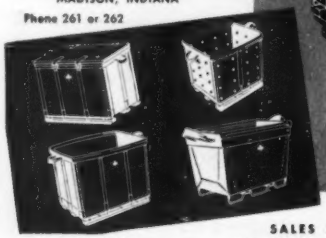

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John:
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Jim

404. LAPLESS ENDLESS SPINNER — Bulletin and full information will be supplied on the endless spinner and sueing head of the KEN-RAD CORPORATION, 18 West 61st St., New York, N. Y.

405. CARD SPINNING INFORMATION—Outline note of product improvement as noted in the grinder for spacer of card is sent to mailing list. Other pertinent information.—E. B. MOT & SON CO., Worcester, Mass., and Charlotte, N. C.

411. SPINNING MACHINERY—Illustrated folder describing Hacker and Company's precision spinning machinery for cotton, wool, worsted, silk, rayon and blends available for immediate shipment.—AMERICAN TEXTILE ENGINEERING, INC., Arlington, N. J.

412. SERVICE FOLDER — Folder covers textile metal products including spinning and twisting spindles, card screens, etc.—TENNANT METAL SHOPS, INC., Seattle, Wash.

414. WORSTED SPINNING—Bulletin explains and illustrates Saco-Lowell's new system for worsted spinning, from top to yarn, in five economical and efficient stages.—SACO-LOWELL SHOPS, 60 Batterymarch St., Boston 10, Mass.

418. THE BRIEF SAGA OF THE RING TRAVELER—An interesting history relative to the ring traveler, which is in reality the basis of the spinning frame. John Thorpe's invention of ring traveler, the development of the spindle, and the invention of Sobrik's Bolster type spindle are covered. — NATIONAL RING TRAVELER CO., Pawtucket, R. I.

422. MODERN TEXTILE ROLL COVERING—Illustrated booklet on roll covering problems with charts on screws and gears. Also data on Aeroz new rod spacer.—ARMSTRONG COMPANY, Industrial Division, TEXTILE PRODUCTS SECT., Lancaster, Pa.

423. PNEUMATIC ROLL PICKER—Attractive Bulletin descriptive of the "Amoskeag" roll picker that removes fly and lint from the top rolls and other spinning elements in drawing and roving frames.—M-M PRODUCTS, Dover, Mich.

429. HYGROLIT YARN CONDITIONING SYSTEM—Illustrated folder No. 501A describing the Hygrolit System for maintaining yarn conditioning.—KEARNEY MANUFACTURING CO., Worcester, N. Y.

435. ROTARY TANK SCREEN—Advertising describes function and use of rotating air washer tank screen which eliminates vertical strainers and increases air washer maintenance. — THE LINDLEY CO., Piedmont, Mass., and Charlotte, N. C.

437. SPINDLE TAPE LACING EQUIPMENT—Circular No. 54 illustrating and describing the Clemco method of joining spindle tapes.—CLIFTON BELT LACER CO., Grand Rapids 8, Mich.

440. SADDLES — Leaflet showing a few of the various types of saddles. Types of saddles for vertical and cone drives, spinning, and twister frames.—DIXON LUBRICATING SADDLE CO., Dixon, Illinois Bldg.

441. SKF BALL BEARING TENSION PULLEY FOR SPINNING FRAMES—Attractive illustrated folder describes the rules of anti-friction bearing tension Pulleys for all types of spinning frames.—SKF INDUSTRIES, INC., Philadelphia, Pa.

442. CONFIGURATIVE YARN TABLE—Chart giving weights, counts and run per pound, also suitable for worsted and cotton systems. Conversion Woven Cotton Yarn Table.—VICTOR MFG. GRAVITY CO., Providence, R. I.

443. ROLLER DRAFTING SPINDLES—Illustrated folder showing Parks "One" Aluminum Roller Drafting Spindle. Also Parks Aluminum Spindle Rail. Spindle is universal to all spun fibers and is replaceable in two minutes.—PARK ALUMINUM SPECIALTY PRODUCTS CO., Cleveland, Ohio.

447. WINDING MACHINES — Principles and Features of the Foster Model 66 Winder. Page 2 of the New 24 Page Catalog is a two-color illustrated with cutaway view showing yarn guard rod finger, pin, or drum winders.—UNIVERSAL WINDING CO., Providence, R. I.

447. CORE WINDER—Form A55 describes the Foster Model 66 winder which produces the Foster knitting cone for spun yarns, warping cones and cheese, slubbing and twister spools.—FOSTER MACHINE WORKS, Wyomissing, Pa.

448. TUNGINE LUBRICATING—Problem of solidification, separation, evaporation, oxidation as related to various lubricants discussed in folder entitled "Tungine Lubrication."—H. J. HOUGHTON AND CO., Philadelphia, Pa.

454. CARD AND PICKER BEARINGS—Four-page two-color folder describes this manufacturer's ball and roller bearings for cards and pickers.—SOUTHERN GRAVES EQUIPMENT CORP., Gastonia, Ga.

455. CONICAL RINGS AND FLYERS—General folder on Ring and Flyers entitled "Ring and Flyer Manufacturing Co. Ltd." Lists 4 pp. —, N. Y.

456. TENSION CONTROLS — Folder describes tension compensation and automatic warping control. Also describes Scantling Warp and Yarn Tester. Described with specific applications. — WALKER BIDDLE & CO., INC., Bellevue 2, N. Y.

WEAVING, SLASHING . . .

464. LOOMS—An assorting wire folder is available entitled "Questions and Answers Regarding Our Line of Looms." Information on all types fully discussed. — CROMPTON & KNOWLES Loom WORKS, Worcester 1, Mass.

502. COUNTING AND MEASURING DEVICES—Illustrated Textile Catalog illustrating and describing pick counters, hank counters, cut meters, measuring counters. Wide range of counting devices for production recording on all types of textile machinery. —VEEDER-ROOT, INC., Hartford, Conn.

507. WEAVER'S KNOTTER—A catalog on the Weaver's Knotter giving a few instructions as to its use, recommendation as to the proper type knotter for the various types of yarns, and the proper care and upkeep of the knotter.—A. E. CHAMBERLAIN & CO., Lowell, Mass.

504. LOOM SUPPLIES — Literature describing complete line of steel reeds, harness frames, dobby cords, sticks, hickory bumpers, brass rings and allied products.—E. H. JACOBS NORTHERN DIV., THE BULLARD CLARK CO., Danielson, Conn.

507. SLASHER PRODUCTION—GW-488, new bulletin on slasher production, describing how quality yarn can be improved through the use of this equipment's variable speed positioned. Its automatic control and regulate the speed of the main drive, beam drive and steam pressure of the cylinder.—KENYON PULLEY COMPANY, Columbus, Ind.

508. LOOM PRODUCTION CHARTS—Convenient calendar card showing yards per loom, per week of 48 hours at various loom speeds.—RALPH E. LOFTIS CO., Greenville, S. C.

516. THE ROMANCE OF PRAIRIE GOLD—Attractive illustrated book which tells the story of corn and the uses of corn products in industry.—CORN PRODUCTS SALES CO., New York, N. Y.

518. SEYCO PENETRANTS FOR YARN CONDITIONING—Folder describes the scientifically controlled Seyco sizing. — ARTHUR WOOLLEY & CO., Atlanta, Ga.

515. TEXTILE COUNTER—Catalog No. 24 illustrating and describing complete line of Production Loom Pick Counters; Hank Counters; Yardage Electric and Predetermined Counters; Tachometers, etc. — DURANT MANUFACTURING CO., Milwaukee 1, Wisconsin.

518. WEAVE ROOM ACCESSORIES—Weave room accessories catalog and literature on new Sleeve, bronze bearing sleeve, which eliminates oiling in weave room problem.—SIMMONS LOOM HARNESS COMPANY, Lawrence, Mass.

517. LOADING SYSTEM—Bulletin 417, on pneumatic loading system for Foster-Lowell slasher yarn box squeeze rolls, covering installation, operation, maintenance and prices.—STEIN HOLDING COMPANY, Fortboro, Mass.

518. NIAGARA TWIST-SETTER—Folder describing the revolutionary Niagara Twist-Setter which keeps an moving parts. This yarn is sprayed from all sides to afford maximum coverage.—GYDEL-WOOLLEY & CO., Atlanta, Ga.

521. STEEL WARP BEAMS—66 page Catalog No. 48 illustrating Standard and Special Purpose Warp Beams for the weaving industry, from the finest to the coarse fabrics. Also Textile Machinery specialties.—MILTON MACHINE WORKS, INC., Milton, Pa.

525. OVERHEAD MOUNTS FOR BIGGER LOOM BEAMS—Folder illustrating and describing how bigger beams can be adapted under 60 mill conditions, including Model 1 Multiple Unit, showing increased beam capacity possible with bigger beams.—WOOD'S POINT FOUNDRY & MACHINE COMPANY, West Point, Ga.

534. JOHNSON WARP SIZES—12 page fully illustrated booklet, describing the 7 colloids sizer with proven indicator and size-mix system for accurate point-by-point control.—CHARLES H. JOHNSON MACHINE WORKS, Passaic, N. J.

539. LOOM EQUIPMENT—Folders on Set holdings, tongues, reed reeds for all types of looms and cards.—WOLFE MFG. COMPANY, Philadelphia 47, Pa.

529. STRAPPING — Loose and tension straps for cone bobbins. Full information, including samples.—LOOM KING CORPORATION, 14 West 23rd St., New York 10, N. Y.

530. ROTARY UNIONS—How cooking steam, how to get it to the yarn, get better cooking, on new layers, slashers, calenders, etc. Catalog No. 200 entitled "Rotary Steam Connections Types."—PERFECTION METAL CO., Greensboro, N. C.

DYEING, FINISHING, CLOTH ROOM . . .

526. DEFUNA—An odorless, tasteless, non-corrosive emulsion which is highly effective as an oxidizer, useful in all phases of dyeing and printing. —AMERICAN ANILINE PRODUCTS, INC., New York, N. Y.

535. CONTINUOUS AUTOMATIC EXTRACTING MACHINE — Folder describing the new, efficient method of extracting stains, liquids from porous materials.—C. G. SARGENT'S SONS CORP., Graniteville, Mass.

537. DYEING OF TEXTILES—Bulletin S-1538 explains how uniform results can be secured in process by temperature controlled dyeing. Illustrates point has indicating thermometer on which settings are changed by turning a knob. Diagram of system.—GABCO CO., INC., New York City, N. Y.

540. PROCTOR DRYING MACHINERY FOR THE TEXTILE INDUSTRY—Illustrated, descriptive catalog on all types of dryers for raw stock, warps, skeins dyed and unbleached cotton yarn. Also specialties Preparation and Automatic Conveyor Systems for hosiery.—PROCTOR & SCHWARTZ, INC., Philadelphia, Pa.

514. STRIPS IN ROLLS—Form No. CF-643 illustrated folder showing use of Strips in Rolls made for Textile use.—CELANESE CORPORATION OF AMERICA, New York.

512. CLOTHROOM EQUIPMENT—An eight-page brochure is available describing clothroom machinery, Shearing, Brushing, Bowing and Inspecting Machines. Also Duffle Shearing and Duffle Brushing.—CHARLES McCRINN CO., Hawthorne, N. J.

524. STRAIGHTENING THE WEFT IN CLOTH—Article describing the progress made in this field and latest machinery available for both shrunk and uncut weft straightening.—MOUNT HOPE MACHINERY CO., Taunton, Mass.

527. SINGLE APRON STOCK DRYERS—Folder presenting the latest idea in economic dryer which cost will be fully covered by savings made possible and to meet modern manufacturing conditions.—C. G. SARGENT'S SONS CORP., Graniteville, Mass.

525. HEAVY SQUEEZE ROLL UNIT — With built-in folder and variable speed motor drive for padding and extracting. Has capacity of 10 ends and is fitted with roller bearings. Also has new combing rollers. Fully discussed in Circular No. 1001.—BIRCH BROTHERS, INC., Somerville, Mass.

529. VAT DYEING OF WOOL—Write for Calco Technical Bulletin No. 797 outlining fundamental dyeing procedure and explaining how advantage is taken of the peculiarities of wool fiber.—CALCO CHEMICAL DIVISION, AMERICAN CYANAMID CO., Bound Brook, N. J.

532. LUG STRAP WASHERS—Series 1-C illustrated bulletin detailing right and wrong combination and use of washers.—E. H. JACOBS NORTHERN DIVISION, Danielson, Conn.

533. PRINTING WITH ARIDYE PIGMENT COLORS—Bulletin P-1 describing preparation and application of pigment colors, including the following: natural, resin, fine, and paste colors.—DYSTUFF CORP., TEXTILE COLORS DIV., Brooklyn, N. Y.

538. ROTARY DYEING MACHINE—Series No. 670 illustrating the Foster line of machines used for dyeing of yarns, carpet yarn, hose, gloves, socks, etc.—SNIDER, DRUM & CO., Philadelphia 32, Pa.

STUFFS, CHEMICALS, SOAPS . . .

701. MAGNESIUM AFFINITIES—Data, latest information on commercial applications for the use of its salts published recently by the Technical Service Department of the Dow Chemical Company, Midland, Mich.

703. THEORETICAL AND APPLIED SILK-DEGUMMING—Attractive 32-page booklet publishing results of silk-scouring and outlining investigations on the soaking, back-winding and degumming of silk.—HART PRODUCTS CORP., New York City.

712. VANDERBILT MATERIALS—Attractive 8 x 6-page booklet describing new Vanderbilt Materials now available. — R. T. VANDERBILT CO., INC., New York, N. Y.

713. LIGVATINE ED—Yes dyeing assistant Ligvatine ED is recommended for level dyeing of wool, speeds up dyeing of color.—HARDOL CHEMICAL WORKS, New York City.

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7[illegible]. AQUAROL AND ARKANSAS PRODUCTS—Bulletin on Aquarol water repellent finish with method of preparing bath; also on other Arkansas products for cotton, wool, silk and rayon hosiery processing.—ARKANSAS CO., INC., Newark, N. J.

738. LEVELENE—Booklet describing use of Levelene for leveling vat and direct colors, also for stripping down vat colors.—AMERICAN ANILINE PRODUCTS, INC., New York, N. Y.

745. RAPIDASE FOR DESIZING—Bulletin explaining in detail the properties and characteristics of Rapidase.—WALLERSTEIN CO., INC. 180 Madison Avenue, New York 16, N. Y.

748. WATER SOLUBLE GUMS—Booklet giving the origin, gathering, marketing and uses of water soluble gums. This booklet No. 13 is beautifully illustrated and is one of the few treatises on the subject.—JACQUES WOLF & CO., Passaic, N. J.

750. SUPERCLEAR—Leaflet describes this scientific printing thickener which is an ideal thickener for printing all types of textile fibres and fabrics. Noted for its extreme purity, seamless reliability and exceptional penetrating properties.—JACQUES WOLF & CO., Passaic, N. J.

756. TEXTILE SPECIALTIES—Listing and describing a wide and complete range of specialties manufactured and sold by American Cyanamid Company formulated to the latest advances in textile chemistry.—AMERICAN CYANAMID COMPANY, 30 Rockefeller Plaza, New York 20, N. Y.

762. ONYX TECHNICAL DATA SHEETS—Two new data sheets describing the use, advantages, and applications of Xyno Resins S 10 and Xyno Resin 2[illegible].—ONYX OIL & CHEMICAL COMPANY, Jersey City 2, N. J.

765. HOSIERY FINISHES AND FORMULAS—Attractive new booklet describing the Amalgamated line of hosiery finishes and giving numerous finishing formulas.—AMALGAMATED CHEMICAL CORPORATION, Philadelphia 34, Pa.

766. DU PONT PEROXIDE BLEACHING SYSTEMS—New book illustrating and describing this continuous peroxide bleach system. Layouts and other information included.—E. I. DU PONT DE NEMOURS & CO., ELECTROCHEMICAL DEPT., Wilmington, Del.

768. SURFACE TENSION DEPRESSANT—The Booklet, "Mercerizing and [illegible]—The Ideal Dry which can be used as a wetting agent, a dye leveling agent, a penetrant in package dyeing.—HART PRODUCTS CORP., New York, N. Y.

771. "STARCH STABILIZER"—Folder on Vanzene, a product used for textile sizing and printing, discussing [illegible] and the results [illegible].—R. T. VANDERBILT CO., New York 17, N. Y.

773. TECHNICAL CHEMICAL DATA SHEETS—Complete set for dyeing, printing and finishing operation, showing major operations, performance and advantages.—ONYX OIL & CHEMICAL CO., Jersey City 2, N. J.

777. HOSIERY DYEING—Catalog on hosiery dyeing machinery, skein dyeing machinery, package dyeing, extracting and drying equipment.—[illegible] DRUM AND CO., Philadelphia 23, Pa.

778. DESIZING ENZYME—Data sheet "HT" describes new stable high temperature desizing agent. Effective on both starch and gelatine sized goods. Being used by the continuous, one-steam method.—ROYCE CHEMICAL COMPANY, Carlton Hill, N. J.

780. HYDROGEN PEROXIDE—Compilation of physical data and properties of hydrogen peroxide. Reaction listed in organic and inorganic chemistry along with application.—BECCO [illegible] CORP., Buffalo, N. Y.

KNITTING . . .

801. THE WILDMAN SINGLEHEAD FULL-FASHIONED HOSIERY MACHINE—Literature on request from the WILDMAN MFG. CO., Full-Fashioned Division, Norristown, Pa.

80[illegible]. THE TUBE-TEX FOR TUBULAR KNIT GOODS—Bulletin describing this modern machine which extracts, processes, dries, conditions and folds in one continuous operation, lowering costs, saving labor, power, space and waste.—H. W. BUTTERWORTH & SONS CO., Beth Ayres, Pa.

808. STATISTICAL SURVEY—Covering the Full-Fashioned Hosiery knitting industry in the United States and Canada.—TEXTILE MACHINE WORKS, Reading, Penn.

810. ALUMINUM BEAMS—Catalog No. 1-51 describes Hayes magnesium and aluminum specialties for the textile industry. Illustrates this company's beams that are one-third the weight of conventional types.—HAYES INDUSTRIES, INC., Jackson, Mich.

812. CIRCULAR KNITTING MACHINES—Interesting, informative and well illustrated is this six-page folder, just released, which describes this company's small diameter circular knitting machine.—H. BRINTON COMPANY, Philadelphia 34, Pa.

816. THE NEW REINER KAYLOOM—A combination Knitting Weaving Loom, featured in an illustrated catalog, showing filler attachment and other important points along this machine.—ROBERT REINER, INC., Weehawken, N. J.

817. AUTOMATIC SELECTIVE STRIPPING MACHINE—Descriptive and illustrative folder, entitled "If It's Stripes, Consult Brinton," now available. Important mechanisms involved in the process are described.—H. BRINTON COMPANY, Philadelphia, Pennsylvania.

818. MILTON LIGHT METAL BEAMS FOR EVERY APPLICATION—Catalog 4-A describing Light Metal Tricot Beams made in Standard and Special sizes plus Special Purpose Light Metal Textile Equipment.—MILTON MACHINE WORKS, INC., Milton, Pa.

820. VARIABLE STRIPES AND PLAIDS—Booklet describing Supreme Models SA and SA-ROF Stripers for knitting plaids, checks, "footless" designs and variable stripes.—SUPREME KNITTING MACHINE CO., INC., 196 Johnson Ave., New York.

82[illegible]. THE KIDDE KNITTER—Bulletin describing this newest in Raschel-type warp knitting machine and higher production attained with it.—KIDDE MANUFACTURING CO., INC., Bloomfield, N. J.

SEWING MACHINES . . .

915. THE NEW UNION SPECIAL LOCKSTITCH MACHINE—Information on the new model which [illegible] production time on sewing operations, is contained in Bulletin No. [illegible].—UNION SPECIAL MACHINE CO., Chicago 10, Ill.

916. THE SUPERLOCK—Bulletin [illegible] describing and illustrating the W & G Superlock [illegible] machine.—WILLCOX & GIBBS SEWING MACHINE CO., 214 W. 39th St., New York 18, N. Y.

918. FEED-OFF-THE-ARM FELLING MACHINE—Bulletin No. [illegible] illustrates and describes the "Fedlock" with Automatic Lubrication, for lap seam felling on shirts, [illegible].—WILLCOX & GIBBS SEWING MACHINE CO., New York, N. Y.

MATERIALS HANDLING . . .

1001. HOW TO DETERMINE WHERE OVERHEAD MATERIALS HANDLING EQUIPMENT CAN BE USED PROFITABLY—Profusely illustrated. Gives clear, concise understanding of materials handling. Helps you to determine where and what equipment might be used to speed production and increase profits.—CLEVELAND TRAMRAIL DIV., Wickliffe, Ohio.

1002. CATALOG NO. 22—An attractive illustrated catalog describing in detail the Shamrock shipping containers and the new canvas trucks for textile use.—MEESE, INC., Madison, Ind.

1004. CASTERS AND WHEELS—[illegible] pages describing casters and wheels suitable for all types of industrial applications. Every mechanical engineer and purchasing agent should have this.—DARNELL CORP., LTD., Long Beach, Calif.

1005. BASKETS, HAMPERS & TRUCKS—This 24-page catalog is profusely illustrated and contains complete description on the Dandux line especially designed for the textile industry.—C. R. DANIELS, INC., Daniels, Md.

1006. LANE CANVAS BASKETS—16 page illustrated booklet describing the Lane line of canvas baskets for textile use.—W. T. LANE & BROTHERS, Poughkeepsie, N. Y.

1007. OVERHEAD HANDLING EQUIPMENT—50 pages of illustrations showing successful applications of monorail systems to meet every kind of handling problem.—THE AMERICAN MONORAIL CO., Cleveland, Ohio.

1008. CASTERS AND WHEELS—An illustrated booklet with complete specifications showing a complete assortment of Cotton Textile Casters.—THE COLSON CORP., Elyria, Ohio.

1009. CANVAS PRODUCTS—A complete listing with illustrations of Dandux Canvas Products. For easy fingertip reference and handy file size. Brief but factual information.—C. R. DANIELS, INC., Daniels, Md.

1010. CONVEYOR KEY BOOK—A guide to production "step-ups" now possible with modern conveying. Shows time-and-effort savings. Well-illustrated with photos showing plant layouts and sketches showing where, how and why different types of conveyors are used for maximum results.—LOGAN COMPANY, INC., Louisville, Ky.

1011. TEXTILE TRUCKS—Booklet describing doff boxes, frames and trucks, yarn, waste, platforms, conditioning, steep lap, fiber, utility trucks, etc. Uses and description.—EXCEL TEXTILE SUPPLY CO., Lincolnton, N. C.

1026. ELECTRIC HOISTS AND CRANES—Booklets describing a complete line of Electric Overhead, Cab and Floor-Operated Traveling Cranes, and a similar complete line of Electric Hoists. All fully discussed with pictures and engineering diagrams.—SHEPARD NILES CRANE & HOIST CORP., Montour Falls, N. Y.

1027. SINGLE-BEAM CRANES—Bulletin No. 1[illegible] describing and illustrating the single beam type of overhead traveling crane.—SHEPARD NILES CRANE AND HOIST CORP., Montour Falls, N. Y.

1030. C-D HOLLOW WARE—This 32-page catalog, B-11, profusely illustrated in color, shows Continental-Diamond's line of boxes, trucks, cans, barrels, baskets and trays. Complete descriptions and specifications are given on each item.—CONTINENTAL-DIAMOND FIBRE CO., Newark 22, Del.

MISCELLANEOUS . . .

1101. AUTOMATIC BOBBIN REFINISHER—A descriptive bulletin illustrating and describing method of refinishing throwing bobbins on a production schedule.—J. M. NASH COMPANY, 2[illegible] N. 30th St., Milwaukee, Wis.

1102. BALING PRESSES—An illustrated folder describing this manufacturer's complete line of balers for all materials. Both Downstroke and Upstroke models.—ECONOMY BALER CO., Ann Arbor, Mich.

1103. UNBRAKO SCREWS—Illustrated 16-page booklet No. 510 gives data on Unbrako hollow set screws, with knurled point, self-locking features. Includes [illegible] screw and locking nut data.—STANDARD PRESSED STEEL CO., Jenkintown, Pa.

1104. INTERPRETATION OF ANALYSIS—In compiling this brief collection of terms which most frequently appear in analysis of surface active chemicals, an attempt has been made to explain as clearly as possible the meaning of these terms to those who have had little or no chemical training.—NOPCO CHEMICAL CO., Harrison, N. J.

1106. ILLUMINATED MAGNIFIER—Folder showing how Pike Flash-O-Lens is used in textile inspection; illustrated to show various models including the Pike Master Magnifier Set.—E. W. PIKE CO., Elizabeth 2, N. J.

1108. FABRICATION OF U. S. STAINLESS STEELS—136-page book covering use of stainless steel in textile equipment from cutting to cleaning. Includes corrosion-resistance tables for chemicals.—CARNEGIE-ILLINOIS STEEL CORPORATION, Pittsburgh, Penn.

1109. PUMPS—Catalog B-151-1 describes complete line of horizontal and vertical centrifugal pumps for every water handling service.—PEERLESS PUMP DIV., Food Machinery Corp., Los Angeles 31, Calif.

1111. BRUSHES—A 24-page booklet is now available which describes and illustrates this manufacturer's line of brushes for the textile industry.—GASTONIA BRUSH COMPANY, Gastonia, N. C.

1115. TEXTILE WRAPPER—Brochure describing automatic wrapping machine for wrapping various types of textile products. Illustrations of packages and all types of wrapping material.—HAYSSEN MANUFACTURING CO., Sheboygan, Wisconsin.

1117. CUSTOM MADE THREAD GUIDES—Illustrated booklet describing uses and physical properties of the "AlSiMag" line of Thread Guides. Advantages fully discussed with picture and specifications of each type.—AMERICAN LAVA CORP., Chattanooga 5, Tenn.

TEXTILE INDUSTRIES, 806 Peachtree St., N.E., Atlanta 5, Ga.

Please send me, without obligation, free booklets or further information on New Equipment items described in the March, 1951, issue of TEXTILE INDUSTRIES.

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Cotton Research Clinic

(*Continued from page 170*)

cal properties of the cross-section of the fiber and the fiber's degree of maturity.

Louis A. Fiori, Cotton Mechanical Processing Division, Southern Regional Research Laboratory, presented, as the second paper of the session, the results of a most important piece of research from the point of view of mill methods. It was on the "Relationship of Fineness to Yarn Properties."

Mr. Fiori expressed the opinion that previous studies of fineness, which have been based on the statistical approach, are unsatisfactory in many ways, and he set out to use a more practical method. At the laboratory they ran four different cottons of varying fineness (Seaberry Sea Island, Mesa Acala, Tanguis, and Rowden) through three drawings, and then cut them to such lengths that when cut, their staple lengths were identical. This eliminated all question as to varying fiber lengths from the experiment. Then these fibers were put back into the picker and run through to yarns of several counts, the object of the experiment being to determine the effect of fineness, and fineness alone, on yarn strength.

The experiments resulted in a number of findings of value to mill management. For example, it was found that the amount of twist used is much more critical with coarse fibers than with fine. At certain twists, and at certain yarn numbers, coarse fibers spin into yarns of as high a strength as fine fibers. However, in going to higher, and particularly in going to lower twist multiples, the strength of yarns from coarse fibers falls off badly while yarn from the fine fibers falls off to a much lesser degree in strength.

These characteristics were demonstrated in a series of charts which will be, when published, of considerable value to mill overseers and superintendents, particularly in mills using the coarser cottons.

As the last paper of this session, J. K. Phillips, Goodyear Tire & Rubber Co., Akron, Ohio, presented "Effect of Gauge Length on the Strength of Cotton Fibers."

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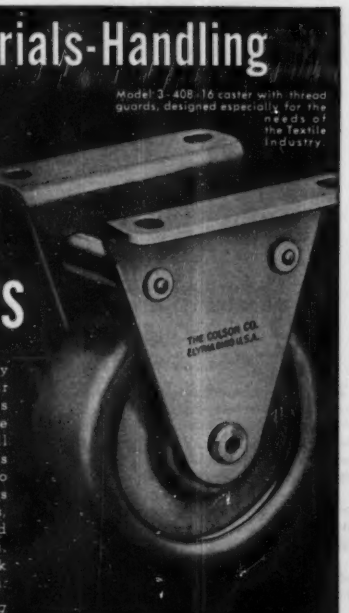
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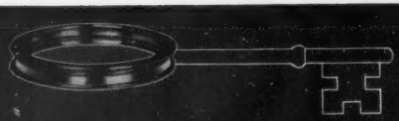

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Mr. Phillips' experiments show promise of direct value to the cotton textile manufacturer. He has attempted to ascertain the reliability of fiber strength tests made with Scott machines and Pressley Fiber Jaws in the conventional manner—that is, with a zero gauge length. He found that there is little relationship between the values for strength determined in this fashion and the final strength of the yarn or cloth. On the other hand, he has found much better correlation between fiber strength and yarn or cloth strength when a 5 mm gauge length is used. He explains this by the "Weakest Link" theory which maintains that there are weak spots in the fiber and that true strength will not be determined over so small a distance as is represented by zero gauge length.

He also found that strength test at 5 mm gauge length came much closer to estimates of cotton classers, and he suggested that perhaps cotton test laboratories owe an apology to classers for criticizing their opinions purely on the basis of zero gauge length tests.

The discussion following the meeting showed disagreement when end products other than tire cord were involved.

A fire-retardant fabric is the most critical requirement for clothing in both civilian and military usage during wartime, according to L. I. Weiner of the Quartermaster Research and Development Laboratories, Philadelphia. He also listed 21 other requirements for cotton outgarments, such as lightness, wind resistance, tear resistance, dimensional stability, etc.

Pointing out that the armed services expect better performance of military clothing now than heretofore, the speaker told of research results in seam efficiency. There has been found wide variations in seam strength and seam efficiency between garments produced by different manufacturers.

Citing the experience of Germany during the last war in attempting to conserve scarce fabrics and clothing, Mr. Weiner said that controls may be expected in the fields of laundering, finishing, and manufacturing if this country goes into full-scale mobiliztaion.

A report was given to show close correlation between actual combat course wear and the abrading of the fabric around a thin bar —in clothing designed for military usage. Such correlation reduces the number of field tests necessary; they can be replaced with laboratory checks.

Mr. Weiner listed the following as programs for conserving manpower and production capacity (on QM purchases): Substitute carded for combed yarns; single for ply; coarse for fine yarns; reduction of pickage in fabrics; utilization of maximum width cloth produced on looms; substitution of continuous filament for spun yarns; and use of extruded sheets for woven textiles.

Allan J. McQuade, also of the Philadelphia QM Laboratory, described a six-man tent made of two layers of cloth which is fire resistant, mildew resistant, and water repellant. It has been treated in a new way which adds but 20% to the weight of the untreated fabric as opposed to a 60% increase with the old treatment method. He further discussed various methods now being used to treat clothing for fire resistance, a factor in which the army is interested. He indicated that the Resinous Nitrogen Phosphate treatment is the best at the current time.

J. David Reid, Cotton Fiber Division, Southern Regional Research Laboratory, reviewed the work which has been done over a period of years on chemical treatment of cotton to change its characteristics without changing its fiber form. He described the various formaldehyde treatments to make cotton resistant to mildew, and he also reviewed the work done on partial acetylation of cotton. He indicated that further research might indicate methods of improving properties of cotton, particularly in crease resistance, warmth, tensile strength, and its resistance to fire, mildew, and weathering.

Industry Probems. The final session of the Clinic was devoted to a discussion of general problems of the industry. John F. Bogdan, research supervisor, Textile School, N. C. State College, reported on

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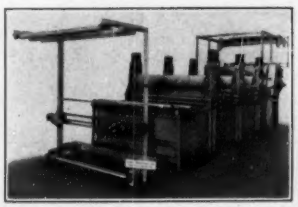

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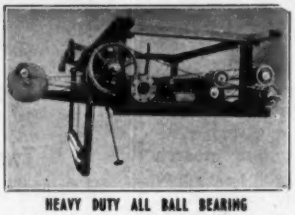

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work he has been doing on control of neps, especially as card settings and speeds affect nep formation.

E. C. Gwaltney, vice-president and director of research, Saco-Lowell Shops, reported on developments in the "Cleaning of Cotton by High-Speed Winding." This work is not completed, but there is indication that high speed winding removes a high percentage of pepper trash, motes, and neps.

John P. Elting, Director of Research, Kendall Mills, Paw Creek, N. C., discussed the causes and effects of what he termed "Cavitomic" cotton—that is, cotton which has been attacked by some fungus, micro-organism, or bacteria. This form of deterioration was first noticed in raw cottons from some areas in the 1948 crop. The same deleterious action has been noted to an even greater degree in the 1949 and 1950 crops and from even wider growing areas. Bales of the bad cotton may contain from 50-100% damaged fibers. There does not seem to be any connection between this type of fiber damage and bowl rot. The Department of Agriculture is now doing work to trace and, if possible, eliminate the trouble.

The final paper of the Clinic was one on "Mill-Scale Evaluation of New Cottons," by G. Dent Mangum, Jr., Technical Service Department, National Cotton Council. This report dealt primarily with the new super-cotton, Hopi Acala, which is a medium staple cotton of very high strength and fairly high coarseness. This western cotton was planted in commercial test quantity this past year, but extremely bad weather prevented a fair sample crop. However, the cotton and other super-cottons hold promise for important improvements in quality in the immediate future.

USDA Proposes Mohair Grade Standards

The Production and Marketing Administration, U. S. Department of Agriculture, is considering the adoption of U. S. standards for grades of mohair and is inviting comments from interested persons on the proposed classifications. Comments will be received up to June 30, 1951.

The proposed standards are the first ever developed by the U. S. Department of Agriculture for mohair. The standards have been established as an aid in trading of mohair by providing a guide that is uniform throughout the nation.

Seven grades are included in the porposed standards and they are Grades 49's, 36's, 32's, 24's 20's, and 16's. These grades have been set up in two series, one of which is for spring mohair and the other fall shorn. A few mohair samples in each of these sets of grades in both series are available for purchase as long as they last. The grade standards also may be inspected in Washington.

Comments on the proposed grades should be submitted to the Director, Livestock Branch, Production and Marketing Administration, U. S. Department of Agriculture, Washington 25, D. C. Mohair grade sets may be purchased f.o.b. Washington, D. C., from this same source (price, $20.00 per set).

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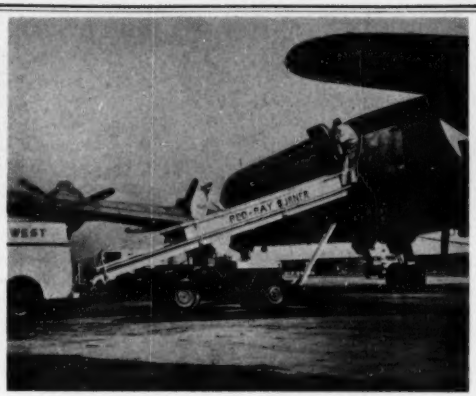

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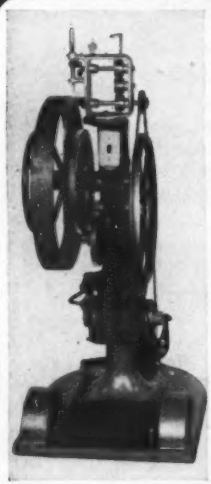

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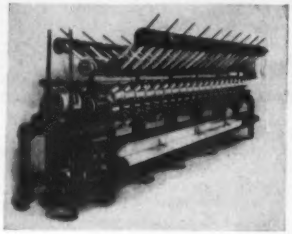

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60—Draper Modified D looms, 68", belt driven, 1918.
7—Draper Modified D looms 78", motor driven, 1934, 1x1 box, 16 harness gem heads.
72—Draper Model E looms, 40", belt driven.
16—Draper Model E looms, automatic for heavy duck; 8—42", 4—64", 4—76", motor driven.
6—C&K 40" Jacquard bath mat looms, motor driven, 1928.
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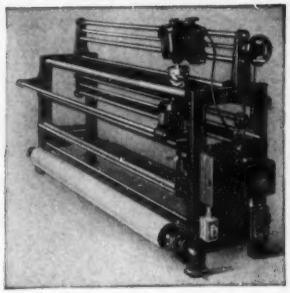

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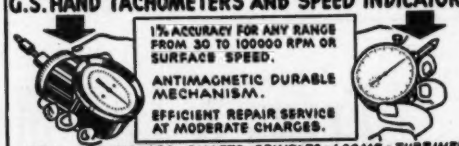
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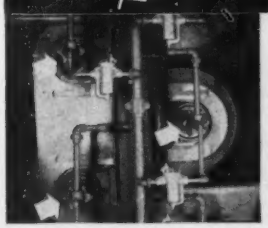

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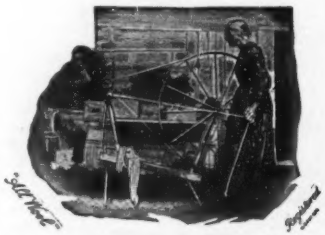

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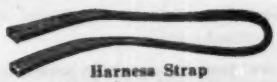

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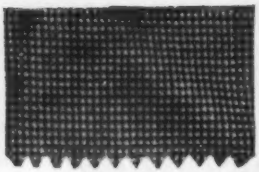

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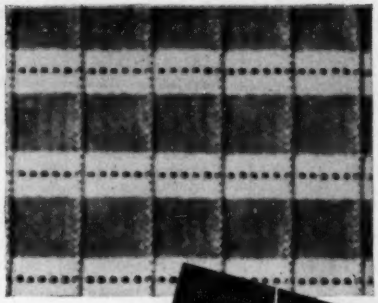

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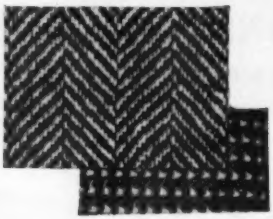

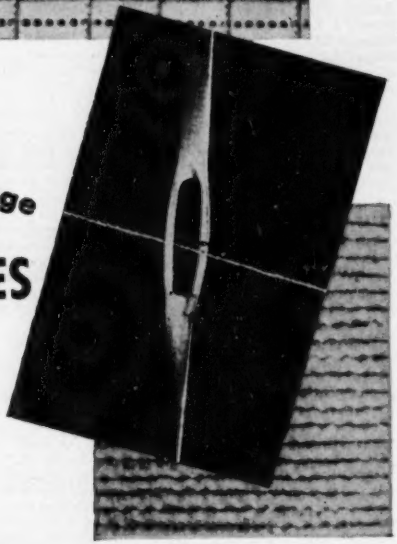

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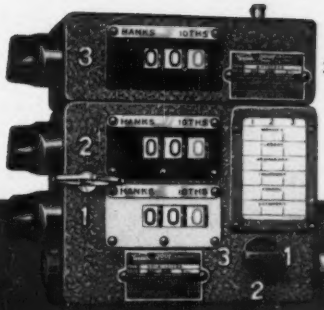

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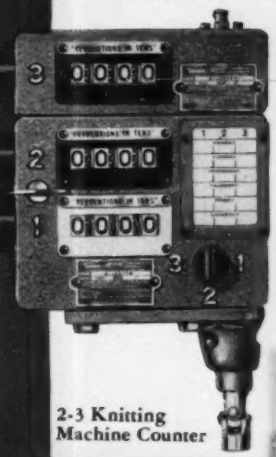

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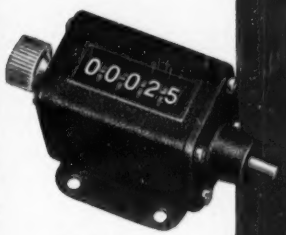

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